March 4, 1991

State of Maryland

Governor's Advisory Council on Recycling

INTERIM REPORT

Costs, Benefits, and Effects of Replacing Certain Packaging Materials Used in Commerce with Other Recyclable Materials:

Part 1: Package Bans, Taxes and Deposits Discussion and Recommendations

Introduction

The Council has been charged to make recommendations concerning the costs, benefits, and effects of replacing certain packaging materials used in commerce with other recyclable materials.[1] This is a broad assignment and the Council has chosen to address it in parts. This paper discusses Part 1: Package Bans, Taxes and Deposits.

The Council is charged broadly to advise the Governor on solid waste recycling. Therefore, the discussion of bans, taxes and deposits focuses on their possible effects on recycling (and some related environmental effects) only. Collateral subjects, such as effects on businesses and consumer convenience, are not addressed.

[1]Executive Order 01.01.1988.08 by Governor William Donald Schaefer.

In March, 1989, Suffolk County, New York drew national attention by imposing a ban on polystyrene and other nonbiodegradable food containers.[2] Since then, at least 20 local governments have enacted ordinances limiting foamed polystyrene packaging and related materials. Bans were a conspicuous subject of many of the 300 plus solid waste related bills introduced in state legislatures during 1990.

Among the many state bills introduced were proposals to tax packages, often in a manner intended to encourage recycling and increased use of recycled material. Related, since 1972, nine states have required deposits on beer and soft drink containers.[3] Although the reasons for mandatory deposits have changed and shifted since 1972 (from an emphasis on refillable containers -- which hasn't happened -- to recycling), a deposit system establishes an infrastructure for the return of these containers to the recycling stream. There also has been federal legislation introduced for a nationwide system from time to time.

The Council's discussions of bans, taxes and deposits incorporated, as much as possible, the findings and reports of others. However, no attempt was made for a thorough review of the extensive literature on these subjects. Some of the pertinent literature is cited here.

The Problem

Beverage containers and other packaging represent a conspicuous portion of the municipal solid waste (MSW) stream. Recent data are that packaging as a whole constitutes 30 percent of MSW, by both weight and volume.[4] However, the percentage of MSW that is packaging has been decreasing slightly since 1972.[5] At the same time, there is some question if the *per capita* waste generation has been holding steady or increasing slightly based on the data in the EPA publications cited in footnotes 4 and 5.[6] Nonetheless, the population of the state and the country have been increasing so that the total amount of MSW generated is increasing. (The population of the country has been increasing at about one percent per year.[7])

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[2]That ban has since been overturned by the court.

[3]California has a mandatory buy-back system, so is not included in the count of mandatory deposit states.

[4]Franklin Associates, Ltd. 1990. *Characterization of Municipal Solid Waste in the United States: 1990 Update.* EPA Report 530-SW-90-042, United States Environmental Protection Agency, Washington, D.C.

[5]*ibid.* and Franklin Associates, Ltd. 1986. Characterization of Municipal Solid Waste in the United States. 1960 to 2000. Final Report to U.S. environmental Protection Agency. Washington. D.C.

[6]H. Alter. 1990. The Future Course of Waste Management in the U.S. *Waste Management & Research.* 9: 3-20.

[7]*Statistical Abstract of the United States.* 1989. U.S. Department of Commerce. Washington, D.C.

The amount of packaging of different sorts in MSW has been estimated from macroeconomic input-output analyses.[8] A summary of the findings is in Table 1. The table does not include the small amount of wood packaging found in MSW. (The original reference includes data on individual packaging types, such as rigid and flexible, beverage containers, and others.)

The types of packaging listed in Table 1 constitute 26.1 percent by weight of MSW and more than half of this is paper and paperboard packaging. Importantly, not all of the packaging listed in Table 1 is recyclable. For example, aluminum foil is not (because of its thinness, it burns up in the smelting furnace)[9] and many forms of paper packaging are coated or otherwise treated so that they are not recyclable.[10] Current developments to recycle flexible plastics packaging are not yet at a commercial stage.

Table 1
Summary of MSW Packaging Composition

Packaging Material	% of MSW Discards 1988	% of Total Packaging Discards 1988
glass	6.3	22.8
steel and aluminum	2.3	8.3
paper & paperboard	14.0	50.7
plastics	3.5	12.7

Efforts to Reduce Packaging and Waste

An often overlooked aspect of the MSW problem is that statistically, packaging reduces food waste. With high statistical assurance, plastics packaging reduces food waste by a factor of 1.6; paper and paperboard packaging reduces food waste by a factor of 1.4. Similar factors could not be computed for steel and glass packaging because the quantities of these in MSW

[8]Franklin Associates, Ltd. 1990. *op. cit.*

[9] Methods of recycling light weight aluminum foil (such as household wrap) are currently being tested.

[10]Conceivably, almost anything is recyclable at a cost. This includes an environmental cost because some materials (such as coated papers) yield large effluents and waste if recycled.

are decreasing.[11] These observations are not to be extrapolated to absurdity to argue for more packaging.

Available data on the composition of MSW[12] show that packaging, as a percentage of MSW, has been decreasing since about 1972. There are four basic reasons. One is the substitution of lighter weight, more efficient packages for what may be termed "traditional packages." An obvious example is the use of a two liter PET (polyethylene terephthalate) bottle instead of a 0.75 liter, heavier glass bottle. A second reason is the light-weighting of virtually all containers. The decrease in weight of some common containers over the years is shown in Figure 1. (Data are from various sources, cited in footnote 6. Figure 1 is reproduced from the paper cited in footnote 6.)

The third reason is the substitution of flexible packaging for rigid packaging and, related, the substitution of multi-material laminates for heavier, more traditional materials. Two examples that illustrate the trend are the aseptic beverage container where a cardboard-aluminum foil-thin plastic foil laminate substitutes for metal, and the "brick-pack" for coffee, where a flexible multi-material laminate substitutes for a steel can. Although the recyclability of the flexible packages is at present questionable, their reduction in weight and volume of packaging waste is very large compared to the items they replace. For example, the coffee brick-pack weighs about two-tenths of the steel can it replaces and from a waste disposal perspective, the two packages will be equivalent when the can recycling reaches 85 percent.[13]

The fourth reason that packaging, as a percentage of MSW, has been decreasing might be an increase in non-packaging residues. There is no known analysis of this factor but it cannot be overlooked.

Concurrent with these trends in packaging waste reductions, there are efforts to reduce waste through product bans, taxes and deposits.

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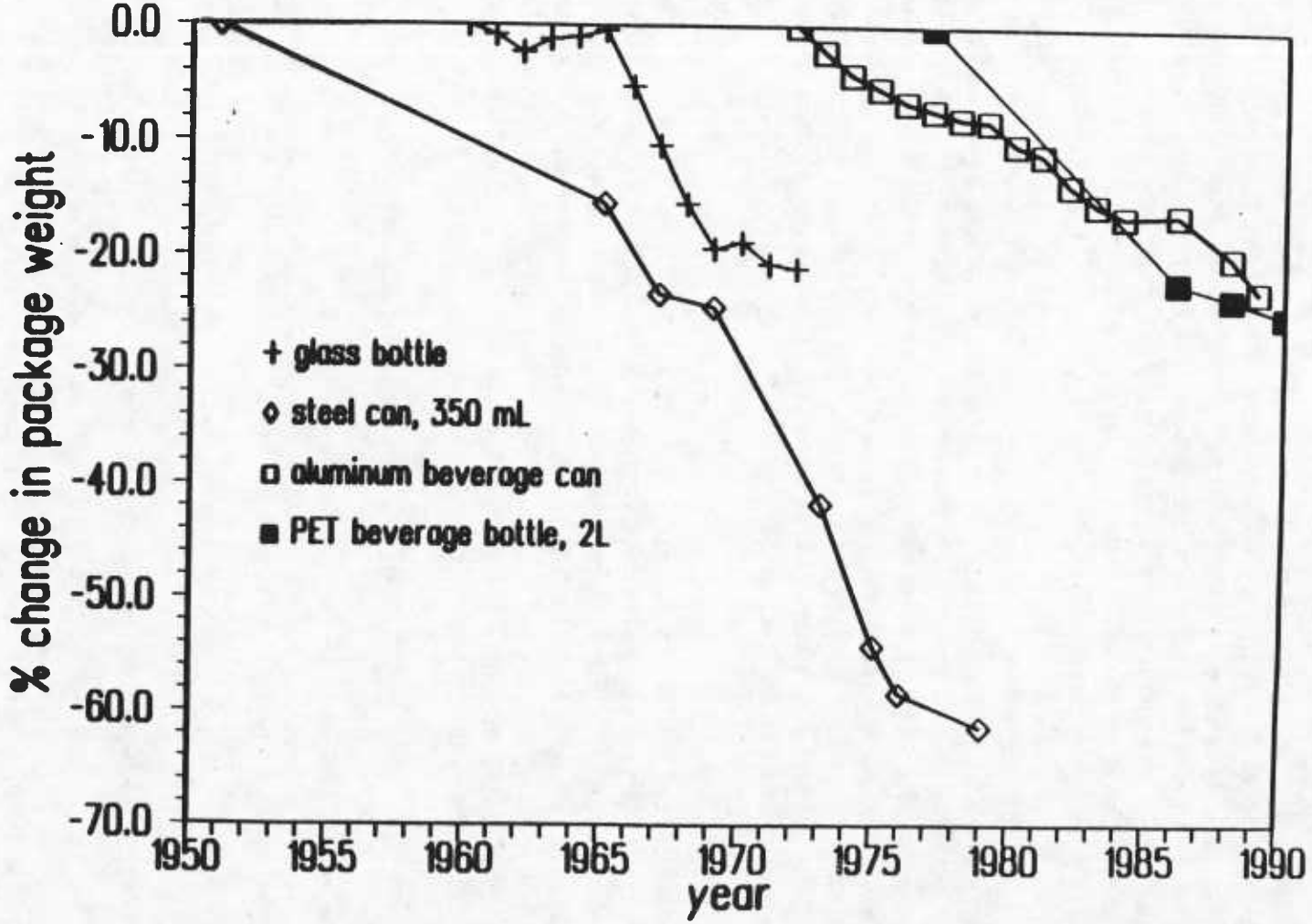
[11]Factors for metal and glass were computed for the situation worldwide. All of the computations are by statistical multiple regression. See: H. Alter. 1989. The Origins of Municipal Solid Waste: The Relations Between Residues from Packaging Materials and Food. *Waste Management & Research*. 7:103-114.

[12]Franklin Associates, Ltd. 1986. Characterization of Municipal Solid Waste in the United States. 1960 to 2000. Final Report to U.S. Environmental Protection Agency. Washington, D.C.

[13]T. Rattray. 1990. Source Reduction -- an Endangered Species? *Resource Recycling*. 9(11): 64-65.


0.0
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
% change in package weight
1950
1955
1960
1965
1970
1975
1980
1985
1990
year
+ glass bottle
◇ steel can, 350 mL
□ aluminum beverage can
■ PET beverage bottle, 2L

Product Bans

Types of bans: Bans can focus on individual products, product materials or toxic components of products.[14] Individual products include goods and/or packaging -- such as disposable diapers -- that are thought to contribute excessively to the waste stream. Product materials are typically plastics. Bans can be proposed at various points along the product lifecycle. Most of the high profile bans have targeted the suspect products at the point of sale, especially in fast food restaurants and grocery stores, rather than prohibiting possession or use. Disposal bans, such as when cardboard or leaves are not allowed to be brought to a landfill or waste-to-energy plant, are intended to encourage recycling. They generate a different sort of response because they place the primary burden of implementation on the waste management system.

Characteristics of bans: Generally, the types of bans proposed around the states have been addressed to specific types of packaging materials. These are either to ban a product or products directly[15] or on types of packaging materials, such as those not biodegradable.[16] The product bans typically focus on materials or items that are ubiquitous, made and/or used by large companies, are not present in MSW in significant quantities, and for which there is not a large constituency. An example is the foamed polystyrene "clam shell" container used by McDonald's restaurants. (Recently, McDonald's announced these will be replaced by coated paper containers.)[17]

As a result, the opposition to such bans is generally from the manufacturers of the materials and containers, not from the general public.[18] Because such bans have these characteristics, even an effective ban will not have a significant effect on solid waste management. Two Yale University researchers[17] concluded that as solid waste policy, bans frequently do not reduce the volume of the waste stream; yet it is their severity that has forced industry to respond with real resources to the solid waste problem; bans are a distraction from the nitty-gritty of solid waste management; and bans lead some members of the public to think that the problems are over and the work is done.

Effect on recycling and solid waste management: Household recycling efforts

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[14]The ban of potentially toxic substances was not included in the Council's discussions reported here. The subject may be discussed by the Council in the future.

[15]Suffolk County's ban mentioned above and the ban on foamed polystyrene packaging in Portland, OR and Berkeley, CA are examples.

[16]As an example, H.R. 500, introduced in the 101st Congress.

[17]There is considerable debate over the relative environmental effects connected with paper or foamed polystyrene packaging. Comparisons are not easy and require detailed analyses. See: M. B. Hocking. 1991. *Paper versus Polystyrene: A Complex Choice. Science.* **251:** 504-5.

[18]R. Lifset and M. Chertow. 1989. The Politics of Product Bans. *The Environmental Forum.* page 12.

concentrate on packages (and newsprint). A ban of say plastic packaging would reduce the recycling of plastic containers. When there is insufficient material to recycle, householders may think they are not contributing to the problem and/or it is not worth their bother, the two reasons people participate in recycling programs.[19] Further, a ban of a light weight package is likely to force substitution with a heavier weight package. Although this new package could be recyclable, and raise the weight of material recycled, this is not a sufficient basis for imposing bans as a solid waste public policy. It merely forces the creation of more waste as some of the new packages are not recycled.

Recommendations: Because packaging bans address only a minute portion of the solid waste problem, and do not contribute to recycling, it is recommended that the State of Maryland take no action to ban any particular package or packaging material.

Packaging Taxes

Types of taxes: The theory is to tax items made of virgin, recyclable or recycled materials differentially so as to affect consumer purchase decisions. This implies that the tax is of sufficient magnitude, and equitably applied, so that the consumer will make such decisions. Further, these sorts of proposals are usually directed only at the packaging portion of MSW.

A popular tax proposal to affect recycling is a surcharge on user fees to pay for recycling programs. (New Jersey imposes a surcharge of $1.50 per ton and then rebates a portion of the fee to counties based on the amount of material they recycle.) This method requires that counties impose a user fee, which requires that they have a scale at their landfill or waste-to-energy facility so that the fee can be computed. Not all Maryland disposal units have a scale.[20] (If the state requires that counties employ user fees to pay for solid waste management, there will have to be consideration of a phase-in period or other means to ameliorate "sticker shock.")

Another approach is illustrated by the practice in Seattle, where user fees are applied only to waste destined for disposal by charging householders a fee per container used.[21] The container for recyclable materials does not bear a fee, thus, in theory, encouraging

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[19]R. De Young. 1990. Recycling as Appropriate Behavior: A Review of Survey Data from Selected Recycling Education Programs in Michigan. *Resources, Conservation and Recycling*. 3:253-266.

[20]In the absence of a scale, the amount of waste is often estimated on a volume basis. This usually assumes that a truck is full and that the average waste density is known. The volume method is notoriously inaccurate.

[21]L. A. Skumatz and C. Breckinridge. 1990. *Variable Rates in Solid Waste: Handbook for Solid Waste Officials*. Vol. II - Detailed Manual. U.S. Environmental Protection Agency Report 910/9-90-012b (PB90-272063).

householders to separate their waste. This may encourage placing nonrecyclable materials in the wrong container. The theory is also to encourage householder waste reduction, although, it is unclear how much control householders have over their purchase decisions so as to reduce waste generation. (The people in Seattle who developed this program are enthusiastic and claim great success in reducing the amount of waste destined from disposal from certain neighborhoods. At least one of these developers prefers a weight-based, rather than volume-based, system.[22])

There have been proposals to impose a tax on providers of packaged goods. Proposals have been offered in several states, notably Minnesota and Massachusetts. Here, something like a 3¢ tax per package is imposed with a 1¢ refund for packages that are recyclable and an additional 1¢ for packages made of recycled material. The unfairness of this can be illustrated with two examples. One is that a refrigerator carton is both made from recycled material and is recyclable, hence would bear a 1¢ tax. A 10-pack package of gum contains several wrappers, hence would bear a tax of more than 30¢. The packaging may be in contact with food and approval to use recycled material is long, expensive, and questionable. This approach has also been termed "an advance disposal fee."

An alternative approach imposes a mil tax on packaged goods at the wholesale level (a form of inventory or gross receipts tax). This method addresses only 30 percent of the MSW. However, it is used in Washington and Virginia to raise funds for litter control. A weakness is that surveys show that packaging makes up a minor portion of litter. This sort of tax does not promote recycling.

There have been national proposals to impose a tax on the use of virgin materials, on the order of $25 per ton. However, the tax would have to be much larger than this and out of proportion to the cost of materials in order to affect consumer purchase decisions. It is unlikely that such a tax could be imposed at the state level.

Equity issues: Any method of collection (and disbursement) of taxes to promote recycling must be equitable. Collection must be from all who contribute to the waste problem. The tax should not be regressive. No one has yet demonstrated a tax system that is effective in promoting recycling.

Effect on recycling and solid waste management: Given the requirement that a tax should be sufficient to promote recycling (and waste reduction), must not be regressive, and must not be out of proportion to the value of the item being taxed, it is difficult to formulate a proposal that would encourage recycling.

A corollary proposal is to use the tax system to offer tax credits for recycling equipment to encourage new recycling ventures and new uses for recovered materials. The

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[22]L. A. Skumatz. Personal Communication to H. Alter. January 1991.

amount of any credit at the State level would be small, given the marginal tax rate in the State. Further, a tax credit presumes that a new enterprise will have net positive income (profit) on which to pay tax. New enterprises often run in deficit for some time and then have a loss carry forward on their tax returns. In other words, often they do not pay tax for the first few years so that a tax credit is not useful to them. Other proposals and systems in place waive sales tax on recycling equipment or offer accelerated depreciation. Again, the magnitude of these inducements is small given the marginal rate of state income taxes. The three tables appended (from the Office of Technology Assessment[23]) summarize what other states have done. The source document does not give any indication of the effectiveness of these programs. However, an unpublished report from the contractor who assembled these tables recommended that none of the programs was of sufficient magnitude to make much difference and concluded that the only support that would affect recycling would be a direct subsidy.[24] The Council may return to these subjects, nonetheless.

Recommendations: Because there is no clear way that any tax system can be equitably applied to affect recycling, it is recommended that Maryland not impose any.

Mandatory Deposits on Beverage Containers

Background: Since 1972, nine states have imposed mandatory deposits on containers for soft drinks and beer.[25] Almost all other states have considered mandatory deposit systems but these have been rejected by referendum and/or in the state legislatures. At the same time, attempts to repeal deposit legislation in some of the nine states has failed, both by referendum and in the state legislatures. The existing systems impose a five or ten cent deposit on the containers; most of these states refund a handling fee to retailers and/or wholesalers, paid from unredeemed deposits.

National deposit legislation has been proposed in the Congress since 1970. In 1989, national beverage container deposit bills H.R. 586 and S. 932 were introduced, but neither went very far. The purposes of the bills were stated to combat litter, conserve energy and resources, and reduce municipal solid waste. The bills mandate a minimum deposit of five cents on every container of soda, beer, and mineral water sold. These bills illustrate that the debate has shifted from the early days, when the goal was to force a return to refillable

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[23]Office of Technology Assessment. 1989. *Facing America's Trash. What Next for Municipal Solid Waste?* U. S. Congress. Washington, D.C.

[24]Franklin Associates, Ltd. 1989. Available from NITS mid-1991. PB 111-9099.

[25]California has a mandatory buy-back system that requires communities to establish buy-back centers conveniently located and in a number proportional to population. See: M. Naughton, F. Sebold, T. Mayer. 1990. The Impacts of the California Beverage Container Recycling and Litter Reduction Act on Consumers. *J. of Consumer Affairs*. **24**: 190-220.

containers, now to encouraging recycling.[26]

The debate over mandated deposits has been heated at local, state and national levels. Aspects of the arguments include the effects on beverage retailers and distributors and on beverage consumption (hence on employment), effects on consumer convenience, effects on the environment, reduction of the amount of waste destined for disposal, and compatibility with recycling programs. Environmental effects include possible reduction in litter and conservation of materials and energy. *Only those points related to recycling and related environmental factors (solid waste management, litter and materials and energy conservation) are within the scope of this report.*

Effect on solid waste management: The most reliable data for the weight and volume of MSW constituents are from the EPA report prepared by Franklin Associates.[27] The data from this report for beer and soft drink containers are given in Table 2.

Table 2. Weight and Volume of Beer and Soft Drink Containers in MSW

Material	wt.% generated	wt.% discarded	vol.% discarded
glass	3.0	0.1	0.1
steel	0.1	0.1	0.1
aluminum	0.8	0.4	1.2
plastic	0.2	0.06	0.4
Total	4.1	3.0	2.5

Table 2 shows that if all beer and soft drink containers were discarded, they would add 4.1 percent by weight to the MSW going to disposal. The amount discarded reflects national estimates of recycling so that if Maryland matched the 1990 national level, these containers contributed 3.0 percent by weight and 2.5 percent by volume to MSW. Deposits do not return all of the containers used. State recycling and deposit law officials in seven of the nine deposit law states estimate that between 72 and 98 percent of beverage containers

[26]There do not appear to be any current published arguments or analyses for returning to a refillable system. This may not be lack of interest but recognition that the filling and delivery systems for soft drinks and beer are now shifted far away from the old refillable system.

[27]Franklin Associates, Ltd. 1990. *op. cit.*

are redeemed.[28] Thus, if the return is the mid-point of other experience (85 percent), a deposit program in Maryland would divert (on average) 3.5 percent by weight and 4.2 percent by volume of the waste in the absence of recycling programs. If Maryland matches current national recycling averages for beverage containers (25 percent),[26] a deposit program would divert 2.6 percent by weight and 2.1 percent by volume. As a final comparison, if Maryland achieves 67 percent recycling of beverage containers (which, on average, is consistent with the 20 percent overall recycling goal now set in the large counties), a deposit program would be a means of diverting an additional 1.2 percent of the waste by weight and less than one percent by volume.

Waste reductions of any of these magnitudes do not affect the fixed and variable costs of operating a landfill or other disposal facility. The amount of MSW generated fluctuates ±25 percent as a general rule[29] and as found in a detailed study in Rockville.[30] A reduction in the amount going to disposal as small (or likely smaller) than shown in Table 2 will have nil effect on disposal costs or may slightly increase the average cost of disposal.

Effect on litter reduction: A recent summary of litter surveys in deposit states[31] reports that roadside litter is composed of from 10 to 20 percent beverage containers by weight and 40 to 60 percent by volume. The cost of litter removal is by item or mile. If removal cost is by mile, then the goal must be a tremendous reduction of all litter so as to reduce the number of litter collection trips. If by item, then the percent reduction by this measure becomes important. The same report summarizes the reduction in litter experienced by four of the mandatory deposit states. The pertinent data are given in Table 3. Whereas the reduction in litter may be impressive, it does not obviate the need for litter collection and control programs.[32]

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[28]U. S. General Accounting Office. Solid Waste. 1990. *Trade-offs Involved in Beverage Container Deposit Legislation.* GAO/RCED-91-25. Washington.

[29]S. H. Russell, R. Brickner, C. Peterson. 1986. The Feasibility Study, Procurement and Construction Management. In: *The Solid Waste Handbook. A Practical Guide.* W. D. Robinson, ed. John Wiley & Sons, Inc. New York.

[30]J. C. Even, P. Arberg, J.R. Parker, H. Alter. 1981. Residential Waste Generation - A Case Study. *Resources and Conservation.* 6:223-240.

[31]General Accounting Office. 1990. *op. cit.*

[32]The "Maryland Beautiful" and "Adopt-a-Highway" programs are such efforts.

Table 3. Roadside Litter Reduction in Deposit States

State	Year	% Reduction
Iowa	1980	38.1 (by vol.)
Maine	1979	10.0 (by item)
Michigan	1986	24.4 (by item)
Oregon	1974	39.0 (by item)

Effects on recycling: Deposit laws increase the number of beverage containers returned for recycling because they establish an infrastructure for this purpose. The amount returned is the product of the content of such containers in MSW (3 percent according to Table 2) multiplied by the fraction redeemed (mid-point of experience is 85 percent), or a recycling of about 2.6 percent of the MSW.

A theory holds that mandatory separation systems will capture nearly as many beverage containers for recycling along with other containers and materials. As pointed out earlier, it has been concluded that people participate in recycling programs when they think they are making a contribution and that the effort is worth their bother.[33] Beverage containers constitute a significant portion of the metal, glass and plastic containers separated for recycling. If a mandatory deposit system removes these from the recyclable stream, there is a question whether people will think that the rest of the program is worth their bother or making a contribution. Although some jurisdictions have dual programs, there are no data available to judge the success of these, compared to single systems, with regard to the goal of maximizing recycling.

The amount of material recycled in a curbside system is potentially about 20 percent of MSW (maximum, not counting yard waste). If the capture is only 20 percent of this (the capture is the participation, the fraction of the material set out by the participants and the yield of material when processed), then the recycling system diverts more waste from disposal than a beverage container deposit system.

The General Accounting Office report (previously cited) reviewed three available reports on the compatibility of curbside recycling and deposit legislation. One of these concluded that in Vermont and New York, the combined programs cost 2 and 2-1/2 times

[33]R. De Young. 1990. *op. cit.*

more respectively than curbside programs alone, assuming a high statewide participation rate (80 to 90 percent), which is not likely to be achieved.[34] Recent data for the City of Newark, New Jersey, showed a maximum of only 40 percent participation, measured over several months.[35] Participation in small or rural communities is much lower.[36] At lower participation rates (hence lower materials yields), the cost of a dual system should be greater. Collection costs (the largest cost element of the program) are fixed per route and high, virtually independent of participation. A recycling program must cost more with mandatory deposits because materials revenues from the recycling program are decreased[37] and a second infrastructure is imposed on the first.

A second report reviewed by the General Accounting Office[38] concluded that a dual system costs less than just a recycling system. However, the data used for composition of waste and costs are old and inapplicable and the computation makes questionable assumptions about the application of "avoided costs."

The third analysis reviewed in the GAO report[39] examines several scenarios of dual systems and concludes that some would cost more, and some less. However, all the computations credit an avoided cost (most of $50 per ton, or twice the national average landfill cost) to the deposit system. This is questionable accounting because there is no cash transfer to the deposit system. When this avoided cost is removed from the analysis, the result is that dual systems of beverage container deposits and curbside recycling cost more.

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[34]The assumptions used in this report may be argumentative. Some would raise the relative cost; others would lower them. However, it is difficult to see how the general conclusion of a higher cost for dual systems would be changed. GAO did not question this conclusion. For the original report, see: Franklin Associates, Ltd. 1988. The Role of Beverage Containers in Recycling and Solid Waste Management: A Perspective for the 1990s. (Prepared for Anheuser-Busch Companies, Inc.) Prairie Village, KS.

[35]F. J. Sudol. 1990. Newark's Curbside Recycling Program: A Participation Study. *Resources, Conservation and Recycling*. in press.

[36]B. F. Schade and R.E. Deyle. 1990. Residential Recycling in Mid-America. The Cost Effectiveness of Curbside Programs in Oklahoma. Paper presented at U.S. Environmental Protection Agency recycling conference. Washington. *Resources, Conservation and Recycling*. in press.

[37]Deposit programs remove the most valuable constituents from other recycling programs: aluminum cans and plastic bottles.

[38]W. B. Clapham. 1984-85. An Analysis of the Potential Effect of Beverage Container Deposit Legislation on Municipal Recycling Programs. *J. Environmental Systems*. 14: 241-267.

[39]F. Ackerman and T. Schatzki. 1989. Bottle Bills and Municipal Recycling: A Preliminary Cost Analysis. A draft report to the U.S. Environmental Protection Agency. Energy Systems Research Group, Inc. Boston.

A deposit system is an expensive way of recycling materials. One estimate is that nationally, this system would cost about $3.1 billion.[40] From the composition of the waste, allowing or not for incomplete return of all containers, this would place the recycling cost above $400 per ton of material returned. Revenues from the sale of recovered material would be about half of this, still making a deposit system an expensive way to recycle compared to other methods.

The GAO report concluded: "Although sufficient data do not exist to determine the extent to which curbside recycling programs could be adversely affected by national deposit legislation, deposit systems can divert potential revenues - particularly the proceeds from the sale of aluminum cans - that help offset these programs' operating costs." Further, ". . . if both systems in combination continue to divert a greater amount of waste away from landfills, as waste disposal costs increase, a dual curbside/deposit system becomes more cost-effective for municipalities." There is nothing in the GAO report, or in the literature cited therein, that addresses the latter statement.

Effects on materials and energy conservation: A deposit system, like a recycling system, returns aluminum, steel, glass and plastic to the economic mainstream. It is not yet established if a deposit system would be more or less effective after the infrastructure for recycling is established.

It is well known that the recycling of materials (particularly those used in manufacturing beverage containers) conserves energy compared to manufacture from virgin materials. However, using secondary materials conserves natural gas, natural gas and petroleum by-products (chemical feedstocks for plastics manufacture), or electricity generated from coal, nuclear or natural gas. (Only about five percent of the electricity in the country is generated from oil.) Any collection and return system (such as a deposit system or a curbside recycling system) involves additional transportation, which consumes additional petroleum products (gasoline and diesel fuel). Superimposing a deposit system on curbside and other recycling systems will increase consumption of these fuels, which are the only ones in potentially short supply.

Recommendations: There is no recommendation. The discussion in the Advisory Council of mandatory deposits for beverage containers as a means of promoting recycling, and thus diverting waste from disposal, reflected all of the pros and cons that have been brought out in past debates in Maryland and elsewhere in the country. Because there was no consensus for a recommendation one way or another, and because the Council members did not want to base a recommendation on a numerical vote, there was a decision not to make any recommendation.

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[40]W. Lesser and A. Madhavan. 1987. Economic Impacts of a National Deposit Law: Cost Estimates and Policy Questions. *J. Consumer Affairs*. **21:** 122-137.

Appendix

Summary of State Tax Incentives

from:

Office of Technology Assessment. 1989.
Facing America's Trash. What Next for Municipal Solid Waste?

Table 8-1—State Tax Incentives (Active and Proposed)

State	Investment tax credit	Property tax exemption	Sales tax exemption	Other
California				Consumption tax credit
Illinois			X	
Indiana		X		
Kentucky		X		
Massachusetts[a]	X			
New Jersey	X		X	
New York[a]	X			
North Carolina		X		Income tax deductions
Oklahoma	X			
Oregon	X (3 programs)			
Pennsylvania	X			
Wisconsin		X	X	

[a]Proposed incentives.

SOURCE: Franklin Associates, Ltd., *Economic Incentives and Disincentives for Recycling Municipal Solid Waste*, contract report prepared for U.S. Congress Office of Technology Assessment (Prairie Village, KS: December 1988).

Table 8-3—State Tax Incentives and Areas of Application

State	Supply-side incentives: For recycling operations			Demand-side incentives: To manufacturers/users of recycled materials
	Equipment	Buildings	Land	
California[a]				CTC
Illinois				STE
Indiana	PTE	PTE	PTE	PTE
Kentucky	PTE			—[c]
Massachusetts[a]				ITC
New Jersey	ITC			ITC
New York[a]	ITC	ITD		
North Carolina	PTE, ITD	ITD	ITD	—[c]
Oregon:				
Business Energy Tax Credit	ITC			
Pollution Control Facility Tax Credit	ITC	ITC	ITC	
Plastics Recycling Tax Credit				ITC
Pennsylvania	ITC			
Wisconsin	STE, PTE[d]			STE, PTE

[a]Proposed incentives.
[b]Includes collection and/or processing operations.
[c]Some users of recycled materials may qualify as recycling operations.
[d]Some processors qualify as a result of court ruling.
Abbreviations: ITC=investment tax credit; PTE=property tax exemption; STE=sales tax exemption; CTC=consumption tax credit; ITD=income tax deduction

SOURCE: Franklin Associates, Ltd., *Economic Incentives and Disincentives for Recycling Municipal Solid Waste*, contract report prepared for U.S. Congress Office of Technology Assessment (Prairie Village, KS: December 1988).

Table 8-2—State Investment Tax Credits

State	Eligibility	Amount	Comment
Massachusetts	Research and development on recycled and recyclable materials in manufacturing.	50% of R&D costs (100% if performed by institution of higher learning).	Available to corporations manufacturing plastic and paper consumer products.
	Tangible property used in manufacturing.	10% of cost in year of acquisition.	
New Jersey	Recycling equipment used in transportation, processing, or manufacturing.	50% spread over 5 years; may be carried over.	Available to corporations only.
New York (proposed)	Recycling equipment used solely for processing secondary materials.	50%; may be carried over for 4 years.	Includes deduction for construction or improvement of recycling facilities.
Oklahoma	Installation, purchase, and construction of facilities.	20%	Hazardous wastes only.
Oregon (3 programs):			
Business Energy Tax Credit	Equipment used solely for recycling.	35% (10% in each of first 2 years; 5% each of next 3 years). May be carried over for 3 years.	Certification simple, quick. Major state program used by MSW recycling activities. Due to sunset after 1990.
Pollution Control Facility Tax Credit	Equipment, land, and buildings used for recycling.	50% spread over 10 years (5% a year). May be carried over for 3 years.	Credit will be reduced to 25% in 1989. Due to sunset after 1990.
Plastics Recycling Tax Credit	Machinery and equipment used solely for reclaiming plastic and making it into a product.	50% spread over 5 years (10% a year). May be carried over for 5 years.	Applies to capital investment made from January 1, 1988, to January 1, 1989.
Pennsylvania (proposed)	Machinery and equipment used to process and manufacture products from post-consumer waste materials.	50% of equipment cost credit shall not exceed 20% in any year or 50% of total tax liability.	Does not apply to secondary waste material or demolition waste.

SOURCE: Franklin Associates, Ltd., *Economic Incentives and Disincentives for Recycling Municipal Solid Waste*, contract report prepared for U.S. Congress, Office of Technology Assessment (Prairie Village, KS: December 1988).

DRAFT
July 8, 1991

State of Maryland
Governor's Advisory Council on Recycling

INTERIM REPORT

Economics and Financing of Existing and Proposed Systems of Solid Waste Recycling

and

Facilitating the Implementation of Recycling Goals

STIMULATING RECYCLING AT THE MARGIN

Background and Introduction

The Council has discussed means of stimulating the recycling of municipal solid waste (MSW) in Maryland through such methods and policies as providing recycling grants, supporting the implementation and operation of Materials Recycling Facilities (MRFs), and providing loans for people wishing to enter the recycling industry and/or for establishing new facilities for the use of recycled materials. Part of these discussions has been how to finance any of the methods discussed.

There are two general ways of achieving these goals. One would be to provide an income stream that could be used to pay for capital investment or operations year-to-year. The second would be to have programs (and the associated financing) that would sunset after achieving their goals of stimulation. The stimulation could be for day-to-day activities, such as those now required by law, or could be to "stimulate at the margin." This means providing leadership and funds for initiating programs that would become self-sustaining. Stimulation at the margin would be an initial investment rather than providing funds for operation or for activities directed at fulfilling the State's recycling law.

As part of the discussion, the structure proposed in S.B. 680 was examined. This bill would provide a State recycling fund based on a landfill or recycling fee, assessed on each ton of material delivered to a landfill. It was introduced in the 1991 session by Senator Winegrad.

Structure of S.B. 680

Senate Bill 680 offers an innovative approach toward funding activities essential to recycling. The bill would impose a fee of $1.50 per ton of solid waste accepted for disposal at a landfill[1] and would provide funds from some other small sources. (The latter cannot be quantified at this time.) The funds collected would be disbursed as 25% for recycling grants, 50% for MRFs, 15% for recycling loans, 5% for public information, and 5% for State administration. Thus, S.B. 680 provides a useful point to start discussion of funding of recycling activities and what these activities might be.

Table 1 is an analysis of the disbursement of funds within the structure of S.B. 680. The second and third columns of the table list the 1990 population of Maryland counties and the fraction of the State's population in that county. The next two columns list the amount of MSW reported to be disposed of in the county[2] and the ratio of this amount to the population. Note that this ratio varies over a wide range. (The average and standard deviation of the ratio are listed at the bottom. The standard deviation is almost 50% of the average, indicating a wide distribution of values.) The range and standard deviation of this ratio are strong indications that some counties are disposing of waste that was not generated in their county. The average of the ratio corresponds to a *per capita* waste generation of 6.6 lbs/person/day, well above the national average for MSW of less than 4 lbs/person/day,[3] indicating that waste from sources in addition to MSW is going to these landfills.

The remaining columns calculate the distribution of funds under the structure proposed in S.B. 680 in two ways. The first is listed under "25% pop." etc, and shows the amount of money each county would receive if the distribution were in proportion to the population. The second method of analysis is based on actual amounts of solid waste reported to be disposed of, labelled "25 % Reptd." etc., crediting each county with its share of proceeds according the amount of waste reported to be disposed of in that county. In some cases, the amounts calculated under the two methods are close; in other cases they are not.

Table 1 displays the inequities of the method of financing recycling as proposed in S.B. 680. As might be expected, the smaller counties receive very little money for the proposed activities. For example, Kent County would receive only about $4,000 for recycling loans, hardly enough to do anything. Somerset County would receive little more than $1,000 for public information programs, again not enough to make a difference.

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[1]Landfills typically accept non-hazardous solid waste from municipal and other sources. Municipal solid waste includes materials from household, institutional, commercial and some other small sources. Some landfills may also accept construction and demolition rubble.

[2]The amounts of MSW were reported to the Maryland Department of the Environment. It is important to note that the amounts for Baltimore City and Harford County do not include waste going to the waste-to-energy plants.

[3]Franklin Associates. 1990. *Characterization of Municipal Solid Waste in the United States: 1990 Update*. U.S. Environmental Protection Agency., Report EPA/530-SW-90-042. Washington.

Table 1

Analysis of Funds Distribution under S.B. 680

Waste Amount Reported
4,784,552 tons/y

County	Population 1990	fraction of population	Amt. MSW reported	Amt. MSW/ population	recycling grants, $ 25% pop.	25% Reptd	support MRFs, $ 50% pop.	50% Reptd	recycling loans, $ 15% pop.	15% Reptd	public information, $ 5% pop.	5% Reptd
Allegany	74,946	0.015	70,824	0.945	26,983	26,559	53,966	53,118	16,190	15,935	5,397	5,312
Anne Arundel	427,239	0.086	601,184	1.407	153,820	225,444	307,639	450,888	92,292	135,266	30,764	45,089
Baltimore City	738,014	0.148	468,000	0.634	265,709	175,500	531,417	351,000	159,425	105,300	53,142	35,100
Baltimore Co.	892,134	0.179	237,744	0.266	321,197	89,154	642,393	178,308	192,718	53,492	64,239	17,831
Calvert	51,372	0.010	37,440	0.729	18,496	14,040	36,991	28,080	11,097	8,424	3,699	2,808
Caroline	27,035	0.005	31,824	1.177	9,733	11,934	19,467	23,868	5,840	7,160	1,947	2,387
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Somerset	23,440	0.005	15,600	0.666	8,439	5,850	16,878	11,700	5,063	3,510	1,688	1,170
St. Mary's	75,974	0.015	77,409	1.019	27,353	29,028	54,706	58,057	16,412	17,417	5,471	5,806
Talbot	30,549	0.006	34,495	1.129	10,999	12,936	21,997	25,871	6,599	7,761	2,200	2,587
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Worcester	35,028	0.007	110,590	3.157	12,611	41,471	25,222	82,943	7,567	24,883	2,522	8,294
Totals	4,983,468	1.000	4,784,552	1.212	$1,794,207	$1,794,207	$3,588,414	$3,588,414	$1,076,524	$1,076,524	$358,841	$358,841
				0.6593								

average &
stnd. dev. listed

Even the larger counties would not receive enough money to make a difference. For example, if both Prince George's and Ann Arundel Counties processed 20% of their MSW at a MRF, the payment listed would amount to $3.75 per ton. Considering that the national average cost of recycling is between $80 and $100 per ton,[4] it is unlikely that the funding scheme displayed in Table 1 would be enough to stimulate recycling.

The data in Table 1 indicate that more than municipal solid waste is being disposed of in Maryland landfills. There is a serious policy question if a "waste-end" fee should be added to all sources, many of which would not be affected by use of the proceeds of the fee to benefit municipal solid waste recycling. There is a collateral question if adding fees would drive waste out of the State, causing Maryland the sort of difficulties now faced by New Jersey, New York, and other waste-exporting states.

For all of these reasons, the Council concluded that if Maryland is to stimulate the recycling of components in MSW, it must do so by a scheme different than is proposed in S.B. 680.

Objectives of a Stimulation Program

The prime objective any stimulation should be to make recycling an integral part of a self-supporting system. Fiscal prudence dictates that a further objective should be that any stimulation program not require continual appropriations. A further objective might be that a stimulation mechanism is not just for the State to pay for what is already required of the counties by law.

These objectives lead to the conclusion that any new program should be short-lived or self-sustaining and not overly costly. Further, a new program should build upon existing programs, funds and mechanisms.

Current Means to Stimulate Recycling

At present, the State has the Solid Waste Facilities Loan Act (as amended). This Act established a revolving loan fund and provides loans at zero interest rate with no specified pay-back period. In effect, it is a grant program -- not a loan program.

The current status of the Solid Waste Facility Loan Act is given in Appendix I. There is presently available for capital expenditures $4.6 million. The counties and municipalities have not yet put a call on this money.

Possible Means to Stimulate Recycling

In order to meet the stated objectives and build on existing programs, it is recommended that the State *stimulate recycling at the margin*. What is meant by this is that

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[4]Office of Technology Assessment. 1989. *Facing America's Trash. What Next for Municipal Solid Waste?* Congress of the United States. Washington.

funds be provided (from sources described later) for activities that are at the margin or the edge of required recycling, that will be an investment in the future, and not just for operations.

Stimulation at the margin can be achieved by restricted block grants to the counties or direct grants from the State. In either event, the subdivisions should be required to apply for the money, justifying the need and the budget, and that the intended use meets the objectives. The grants should be applied to activities such as:

- travel for state, county (and possibly other) recycling personnel for attendance at meetings (including out-of-state) and other professional development;

- for the University of Maryland to expand and expedite development of an interdisciplinary graduate course in solid waste and recycling management, as previously recommended by this Council;

- for small business incubators to stimulate the formation of new enterprises for recycling and/or the use of recycled materials (small business incubators are described briefly in Appendix II);

- for innovation and technical advancement of recycling, such as add-ons to MRFs, possibly for replication of innovations in recycling technology from other parts of the country, or the world, such as to lease before purchase;

- for innovation in public information programs so as to stimulate participation by householders and/or businesses;

- for mechanical fixes if a MRF does not operate according to design and there is no other recourse for a fix.

The above possibilities are intended as examples and are not in any order of priority. However, they illustrate what is meant by "stimulation at the margin." All of the suggestions would be an investment in recycling for the long term. Most would be quite inexpensive; several would be one-time expenditures. Some would permit municipalities to take risks they otherwise would not take.

The Council considered a one-time waste-end fee (of the order of $1 per ton of waste disposed) to provide a large infusion of capital into the Solid Waste Facilities Loan and/or into a grant account. Even though this was considered only as a one-time annual fee, it was realized that the transaction costs associated with it would be disproportionate to the net yield. However, a waste-end fee, even if levied only once, raises new policy questions of dedicated fees. In this case, it would be levied on what is a county function -- waste management. The Maryland Association of Counties has voiced its opposition to any dedicated fee. A few other members of this Council were hesitant for this and other reasons.

A decided weakness of a waste-end fee is that some counties do not now choose to have a tip fee (or user charge) for disposal. A waste-end fee would then just be a levy on these counties.

It was also realized that there is presently a significant amount of money presently "sitting in the bank" available for the stimulation at the margin. The presently available $4.6 million may be enough. If not, the State could add to this *corpus* through debt or other financing, the same way that the Loan account was established.

Recommendations

It is recommended that an appropriate State agency[5] formulate a plan for stimulation of recycling at the margin, beginning with the discussion in this report. Their recommendations should be costed and compared to the amount of money presently available. If there is a shortfall, there should be appropriate recommendations for funding out of general revenues or debt. In all, this would provide a base of capital for expenditures. This could be from the existing loan or grant funds for solid waste, or from a new account. Related, all funds might be consolidated into a single program.

The criteria for funding should meet the objectives delineated in this report and follow the examples given. The criteria should be clear that funds should not be given for operations and maintenance or for the establishment of functions now required by law.

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[5]For example, the agency could be the Maryland Department of the Environment or the Maryland Environmental Service, or another appropriate agency.

Appendix I

SOLID WASTE FACILITY LOAN ACTS

Solid Waste Facilities Loan of 1983 ($4,000,000)

- 50% grants or loans for feasibility
- 87½ % grants or loans for construction
-100% allowed for State facilities

Solid Waste Facilities Loan of 1986 ($500,000)

- 50% grants or loans for design and construction ($200,000 limit per facility or system)

- 50% grants or loans for design and construction ($250,000 limit)

- 100% grants or loans (limit for feasibility is $350,000) for State or regional facilities or a project with a waste-to-energy component

Recycling Loan of 1988 (($500,000 for recycling only)

- 80% grants for feasibility ($100,000 limit per facility)

- 80% grants or 50% loan for design and construction ($250,000 limit per facility)

Solid Waste Facilities Loan of 1989 ($4,000,000)

- 50% reimbursable grants for feasibility and design ($700,000 limit per facility)

- 100% (with $1,000,000 limit) for a state or regional facility, a facility or system with a recycling component, or a facility or system with a waste-to-energy component)

- Special Condition: recipient will repay funds

Current Situation

As of 1990, 17 grants, totalling $500,000 were made under the Recycling Loan of 1988. Seven projects, totally $495,000 were made under the Solid Waste Facilities Loan of 1986.

These programs are administered by the Maryland Environmental Service.

Appendix II

SMALL BUSINESS INCUBATORS

Business incubators are facilities that provide small, entrepreneurial businesses with affordable space, shared support services and business development services (such as financing, marketing and management). Incubators play a nurturing role in helping young businesses survive and grow during the start-up period when they are most vulnerable.

There are now about 400 incubators in 41 states. By 1995, it is estimated there will be 800 to 1,000 such facilities in the country. Research shows that 80% of companies nurtured in incubators survive, as opposed to an 80% failure rate after five years for small businesses in general.

Incubators typically offer their small business tenants a wide range of shared services as well as access to financial and professional assistance. These services can include: co-location of entrepreneurs to assure the cost-effective delivery of services and to be a focal point for management assistance and on-going tenant networking. Shared services and facilities include: administrative and secretarial, receptionist/answering, conference rooms, computer resources, photocopying, word processing, bookkeeping, A/V equipment, telecommunications, and warehousing (including shipping and receiving).

Other shared "facilities" can include: management assistance, video libraries, access to consultants, group purchasing power (including for health insurance), accounting and legal, financial relationships with lenders, access to government and economic development resources, technology transfer from universities and elsewhere, foreign trade assistance, and new business opportunities through co-op ventures.

There are several types of incubators: public or not-for-profit, private, academic related, and public/private.

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There are two general ways of achieving these goals. One would be to provide an income stream that could be used to pay for capital investment or operations year-to-year. The second would be to have programs (and the associated financing) that would sunset after achieving their goals of stimulation. The stimulation could be for day-to-day activities, such as those now required by law, or could be to "stimulate at the margin." This means providing leadership and funds for initiating programs that would become self-sustaining. Stimulation at the margin would be an initial investment rather than providing funds for operation or for activities directed at fulfilling the State's recycling law.

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DRAFT
June 22, 1991

Structure of S.B. 680

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Table 1 indicates that 4,784,552 tons of waste per year are disposed of at Maryland facilities. This computes to an "average generation" of 5.3 lbs/person/day, again well above the national estimate for MSW, which is an indication that the waste is from more than municipal sources. There is a serious policy question if a "waste-end" fee should be added to all sources, many of which would not be affected by use of the proceeds of the fee to benefit municipal solid waste recycling. There is a collateral question if adding fees would drive waste out of the State, causing Maryland the sort of difficulties now faced by New Jersey, New York and other waste-exporting states.

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Objectives of a Stimulation Program

The prime objective of any stimulation should be to make recycling an integrated part of a self-supporting system. Fiscal prudence dictates that a further objective should be that any stimulation program not require continual appropriations. A further objective might be that a stimulation mechanism is not just for the State to pay for what is already required of the counties by law.

These objectives lead to the conclusion that any new program should be short-lived or self-sustaining and not overly costly. Further, a new program should build upon existing programs, funds and mechanisms.

Current Means to Stimulate Recycling

At present the State has the Solid Waste Facilities Loan Act. This Act established a revolving loan fund and grants loans at zero interest rate with no specified pay back period. In effect, it is a grant program -- not a loan program.

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[4]Office of Technology Assessment. 1989. *Facing America's Trash. What Next for Municipal Solid Waste?* Congress of the United States. Washington.

The current status of the Solid Waste Facility Loan Act (and as amended) is given in Appendix I. There is presently available for capital expenditures $4.6 million. The counties and municipalities have not yet put a call on this money.

Possible Means to Stimulate Recycling

In order to meet the stated objectives and build on existing programs, it is recommended that the State *stimulate recycling at the margin.* What is meant by this is that funds be provided (from new sources described later) for activities that are at the margin or edge of activities, that will be an investment in the future, and not just for operations.

Stimulation at the margin can be achieved by restricted block grants to the counties or direct grants from the State. The grants should be applied to activities such as:

- travel for county (and possibly other) recycling personnel for attendance at meetings (including out-of-state) and other professional development;

- for the University of Maryland to expand and expedite development of an interdisciplinary graduate course in solid waste and recycling management, as previously recommended by this Council;

- for small business incubators to stimulate the formation of new enterprises for recycling and/or the use of recycled materials (small business incubators are described briefly in Appendix II);

- for innovation and technical advancement of recycling, such as add-ons to MRFs, possibly for duplication or replication of innovations in recycling technology from other parts of the country;

- for innovation in public information programs so as to stimulate participation by householders and/or businesses;

- for mechanical fixes if a MRF does not operate according to design and there is no other recourse for a fix.

The above possibilities are intended as examples and are not in any order of priority. However, they illustrate what is meant by "stimulation at the margin." All of the suggestions would be an investment in recycling for the long term. Most would be quite inexpensive; several would be one-time expenditures.

Appendix I

SOLID WASTE FACILITY LOAN ACTS

Solid Waste Facilities Loan of 1983 ($4,000,000)

- 50% grants or loans for feasibility
- 87½ % grants or loans for construction
-100% allowed for State facilities

Solid Waste Facilities Loan of 1986 ($500,000)

- 50% grants or loans for design and construction ($200,000 limit per facility or system)

- 50% grants or loans for design and construction ($250,000 limit)

- 100% grants or loans (limit for feasibility is $350,000) for State or regional facilities or a project with a waste-to-energy component

Recycling Loan of 1988 (($500,000 for recycling only)

- 80% grants for feasibility ($100,000 limit per facility)

- 80% grants or 50% loan for design and construction ($250,000 limit per facility)

Solid Waste Facilities Loan of 1989 ($4,000,000)

- 50% reimbursable grants for feasibility and design ($700,000 limit per facility)

- 100% (with $1,000,000 limit) for a state or regional facility, a facility or system with a recycling component, or a facility or system with a waste-to-energy component)

- Special Condition: recipient will repay funds

Current Situation

As of 1990, 17 grants, totalling $500,000 were made under the Recycling Loan of 1988. Seven projects, totally $495,000 were made under the Solid Waste Facilities Loan of 1986.

These programs are administered by the Maryland Environmental Service.

Appendix II

SMALL BUSINESS INCUBATORS

Business incubators are facilities that provide small, entrepreneurial businesses with affordable space, shared support services and business development services (such as financing, marketing and management). Incubators play a nurturing role in helping young businesses survive and grow during the start-up period when they are most vulnerable.

There are now about 400 incubators in 41 states. By 1995, it is estimated there will be 800 to 1,000 such facilities in the country. Research shows that 80% of companies nurtured in incubators survive, as opposed to an 80% failure rate after five years for small businesses in general.

Incubators typically offer their small business tenants a wide range of shared services as well as access to financial and professional assistance. These services can include: co-location of entrepreneurs to assure the cost-effective delivery of services and to be a focal point for management assistance and on-going tenant networking. Shared services and facilities include: administrative and secretarial, receptionist/answering, conference rooms, computer resources, photocopying, word processing, bookkeeping, A/V equipment, telecommunications, and warehousing (including shipping and receiving).

Other shared "facilities" can include: management assistance, video libraries, access to consultants, group purchasing power (including for health insurance), accounting and legal, financial relationships with lenders, access to government and economic development resources, technology transfer from universities and elsewhere, foreign trade assistance, and new business opportunities through co-op ventures.

There are several types of incubators: public or not-for-profit, private, academic related, and public/private.

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Maryland Dept. of the Environment
2500 Broening Highway
Baltimore MD 21224

Mr. Michael S. Miller
MD State Law Library
Court of Appeals Building
361 Rowe Boulevard
Annapolis MD 21401

Annual Repts.

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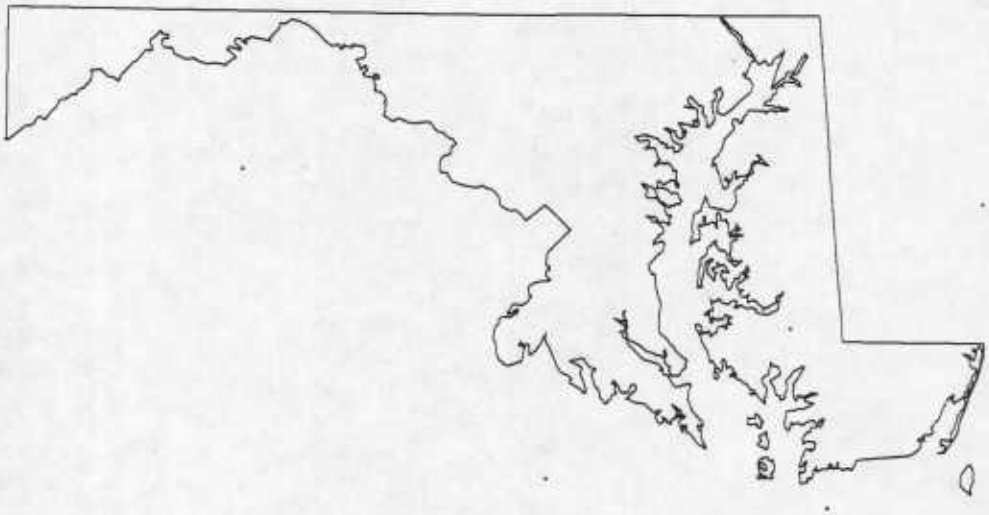
State of Maryland



Governor's Advisory Council on Recycling

Annual Report
1990

DRAFT

State of Maryland
Governor's Advisory Council on Recycling

Annual Report to the Governor
1990

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(1) Coordinating the efforts of the State to facilitate the implementation of the recycling goals at the State and county level;

(1) Identifying local, national and international markets for recycling materials;

(3) Determining the need to expand or construct recycling centers;

(4) Developing rules and regulations for recycling the solid waste stream;

(5) Determining the programs necessary to educate the public on the need to participate in recycling efforts;

(6) Determining the programs necessary to reduce the amount of solid waste generated for disposal;

(7) Evaluating State procurement policies for the purchase of recycled materials;

(8) Researching the economics and financing of existing and proposed systems of solid waste recycling; and

(9) Determining the costs, benefits, and effects of replacing certain packaging materials used in commerce with other recyclable materials and the role of these materials in recycling efforts.

Per the Executive Order, the Council is instructed to report to the Governor annually and interim reports are to be provided as necessary. This is the first annual report. Interim reports (referred to later) were submitted by letter to the Governor.

The Governor's letter of appointment to the Chairman included:

> "In carrying out this charge, the council should meet quarterly the first year. Committees should be formed to address specific issues. Recommendations made by the Council should be accompanied by specific evaluation as to the impact on economics, environment, and other methods of waste disposal, as well as obstacles to implementation."

Further, a preliminary work plan was requested.

Organization and Meetings of the Council

At its first meeting on January 3, 1990, the Council decided to meet monthly, rather than quarterly, in order to carry out their mandates. Further, instead of specific committees, the Council agreed that Task Groups would be formed as necessary to address each of the nine points in the scope as well as related matters as the Council may identify. In this way, members could be involved at the earliest point in addressing more than one point of the scope and could be assigned to other points as portions of the scope were completed.

During 1990, the Council met every month, generally from 9:00 a.m. to noon on the first Monday of the month. Attendance was high, as listed in Appendix II.

The Council Work Plan

In accord with the Governor's request, and in order to plan the Council's activities, considerable effort was expended in the first few meetings to develop and approve a work plan. (During this time, the Council concurrently proceeded with discussion of other items within its charge.) Many of the items in the work plan had to be scheduled to fit in with the State's requirement that the counties submit recycling plans prior to July 1, 1990 and that the Department of Environment had already commissioned a contractor's study to identify local, regional and international markets for recycled materials.

The Council's work plan set out a schedule to address the nine points in the Governor's assigned scope and other matters viewed as pertinent. A copy of the 1990 work plan is included as Appendix III. The work plan also includes a set of questions the Council posed for itself to guide its work.[1]

Interim Reports

An interim letter report was submitted to the Governor on June 22, 1990. The

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[1] The Council began discussion of the 1991 revisions to the work plan at its September 1990 meeting. A revised plan is expected to be approved before March 15, 1991.

subjects covered were as follows:

- Some ways of coordinating State efforts to facilitate implementation of recycling goals at the State and county levels (the text of three papers on audits for waste reduction and recycling, a guide to buying recycled products, and a guide to office recycling were included);

- the results of the Council's review of the contractor's study on markets for recycled materials;

- a recommendation that an Executive Order be issued regarding use of double-sided copying and lighter basis weight papers in State offices.

During the first year, groundwork was laid for several other of the items in the assignment to the Council. Specifically:

An interim report on determining costs, benefits, and effects of replacing certain packaging materials used in commerce through bans, taxes and deposits (beverage containers only) was prepared and scheduled for issuance in February 1991. Another interim report on the financing of existing and proposed systems of solid waste recycling was prepared, scheduled for issuance in early 1991.

In the early part of 1991, an interim report on possible recycling education programs for the State (K-12 and university) will likely be completed.

The subjects of these interim reports are discussed in detail later.

Outside Resources Consulted

During the course of the year, the Council saw fit to invite outside experts for advise and counsel. These were: Mr. Scott Horne, Prince Georges Scrap Co. on the subject of scrap processing, selling and brokering; and Mr. Matthew Coz of Northeast CRINC. This company designs and builds materials recovery facilities (MRFs) and was selected to build the MRF in Montgomery County.

During the course of the year, several outside interested parties attended and contributed to many of the Council's meetings. Many others were consulted by the various Task Groups that were formed.

Summary of Subjects Discussed by the Council and Tentative Conclusions

Some of the key subjects discussed by the Council, which may be considered as work in progress, were:

- A review of county recycling activities, including review of some of the plans submitted to the Maryland Department of the Environment. Several of the Council members presented detailed reviews of some of the County plans. It

was realized that these plans are works in progress, under review by the Department of the Environment, and subject to change. Overall, the Council was impressed by many of the plans and the progress that the Counties have made.

• Methods of office waste reduction, including double-sided copying, the use of lighter basis weight papers and implementation of waste audits. The Council prepared, approved and forwarded to the Governor texts of what could be pamphlets on these subjects. The texts are appended to this report as Appendix IV.

• Encouraging the purchase of recycled materials. Methods for encouraging this throughout the State are under consideration.

• Review of the State's contractor's report (including a presentation by the contractor) on a study of markets for recycled materials. (Task Groups were formed on ports, materials, on the assumptions used by the contractor, and on the role of counties.) Task Groups were formed to review the report for specific items, such as: assumptions leading to the economic and market conclusions, the discussion of the role of ports, and the role of Counties and Municipalities. The discussion assisted the Maryland Department of the Environment in their further discussions with the contractor.

• Discussion of establishing a markets and marketing database for the State, cities and counties, and private sector interests. This included the concept of the State centralizing the marketing of materials collected for recycling and has evolved further into an ongoing discussion aimed at recommendations of possible new State services for municipalities and counties in the field. Task Groups were formed here to address possible specific services for the private and public sectors. The private sector representatives did not think that a particular State service in this field was necessary. Representatives from the Maryland Municipal League and the Maryland Association of Counties are scheduled to present their recommendations in early 1991.

• Long discussion of the possibilities of imposing bans, taxes or deposits to change current use and recycling of packaging. The discussion included opportunities for replacement of certain packaging forms. An interim report is forthcoming which makes several recommendations concerning bans and taxes. It was not possible to reach consensus on beverage container deposits; the same schisms that exist broadly in the State among residents was reflected in the Council.

• Long discussion of means of financing recycling activities, and new solid waste related financing mechanisms in the State. An interim report is forthcoming that addresses some possible new initiatives and ways of funding them. However, despite a great deal of discussion, it was not easy to identify new, needed programs that require funding. The Counties in Maryland have responded well to the mandates of the recycling law and have put in place staff

and infrastructure to comply.

• Possible recommendations on recycling education programs for grades K through 12 and establishing new university programs in the field. Preparation of an interim report will be accomplished early 1991 addressing specific possible State initiatives for improving environmental education on recycling for grades K-12 and steps that can be taken for needed post-graduate education.

The November 1990 meeting was devoted to a tour of the BRESCO waste-to-energy facility and Phoenix Recycling as a means of broadening the education and perspectives of the Council members.

Specific Recommendations

This section repeats the recommendations made to Governor Schaefer sin interim letter reports.

1. Means to Coordinate State Efforts to Facilitate Implementation of Recycling Goals at the State and County Levels. This is a continuing function that must permeate virtually all activities of the Council. As a specific effort, the Council recommends to the Governor the tests of three papers: *Guide to Waste Audits for Waste Reduction and Recycling, Guide to Buying Recycled Products,* and *Guide to Office Recycling*. These were prepared by the Council with the assistance of the Northeast Maryland Waste Disposal Authority. Copies of the texts are included as Appendix IV.

It is our recommendation that the Office of the Governor bring these to the attention of the General Assembly, Counties, Municipalities, all State offices and the private sector. An appropriate State agency should publish and distribute these Guides broadly, or otherwise emphasize to State agencies that they adopt the methodologies in the Guides in the administration of their office functions. The private sector will benefit from the Guides. The Maryland Chamber of Commerce has offered to distribute and publicize the Guides as a mans of increasing recycling int he State.

2. Identification and Evaluation of Markets for recycled Materials. Fortunately, prior to the convening of the Council, the Maryland Department of the Environment proceeded to commission a consultant's study on this complex subject. Therefore, as a first step, the Council review the report, "Maryland Recyclable Materials Study" submitted in January 1990 to Secretary Walsh. The Council found the report a useful first start. It illustrates that markets are dynamic and that a single study cannot fully define markets. Work must continue and the report must be updated form time to time.

Now that an overall view of potential markets has been established, and it has been illustrated that the markets for many potentially recoverable materials are supply -- not demand -- limited, the State should focus periodic attention on marketing and mechanisms to assure recoverable materials meet specifications. To these ends, the Council plans periodically to return to the issue of markets.

As an additional step toward establishing and maintaining markets, the Council has been discussing the scope of a possible database and management information system for the State to assist the public and private sectors to market recovered materials. These discussions should be completed, and a report forthcoming, early 1991.

3. Office Waste Reduction. The Council addressed the ideas of State offices using double-sided copying and lighter basis weight papers as means of waste reduction. The Council was informed that the Office of the Governor is considering and Executive Order to implement such procedures. The Council commends issuance of such an Order at the earliest possible time so that State office can make the necessary transitions. Both double-sided copying and using the lightest basis weight papers possible should reduce costs, as well as waste, for Maryland. State leadership in implementing these changes should encourage the public and private sectors to make similar changes.

Future Activities

Many of the specific charges in the Executive Order forming the Council are on-going tasks. Interim reports will be issued at appropriate times.

Revisions in the Work Plan (Appendix III) for calendar year 1991 were begun in September 1990 during an all day meeting of the Council.[2] The 1991 Work Plan will be issued during the first quarter of the year.

[2]The Council's September 1990 meeting was expanded to a full day. Half of the day was spent on planning, both modifications to the Work Plan and identification of priority issues beyond those in the Executive Order. The Council was able to hold this meeting at the Department of Natural Resources Conference Center on Wye Island.

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Appendices:

I. List of Members, who they represent, and expiration of term.

II. Attendance list.

III. Work Plan.

IV. Texts of Pamphlets

State of Maryland
Governor's Advisory Council on Recycling

Harvey Alter, Ph.D.
Chairman

February 12, 1991

Hon. William Donald Schaefer
Governor, State of Maryland
State House
Annapolis, Maryland 21401

Dear Governor Schaefer:

I am pleased to submit the first annual report of the Maryland Governor's Advisory Council on Recycling, as required by your Executive Order establishing the Council. It is submitted on behalf of all of the members and others who have contributed to the work of the Council during 1990.

Please note that in its first year of existence, the Council addressed many aspects of municipal solid waste recycling and reduction. Some of these efforts resulted in various interim reports (which are summarized in the Annual Report); others have led to several draft interim reports that we expect will be made final during the beginning of 1991.

The Council respectfully draws your attention to several recommendations in the report and looks forward to your response. We stand ready to provide additional information to you as you may wish.

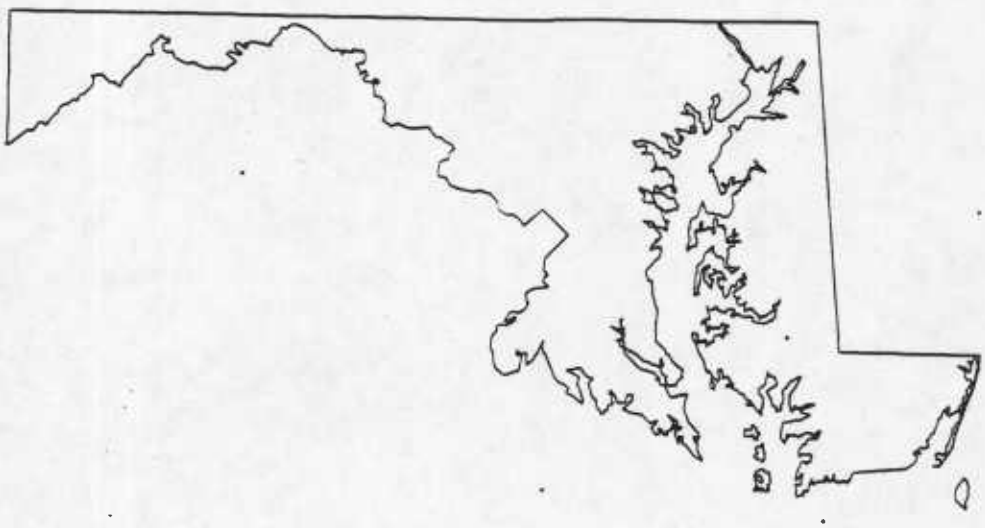
At the end of the first year, the Council is optimistic as it addresses additional points in your assignment and related topics.

Sincerely,

Harvey Alter, Chairman

cc: Hon. Robert Perciasepe
Mr. Mark L. Wasserman
Mr. Gerald L. Thorpe
Members of the Council

State of Maryland



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This is the first annual report of the Council. As such, it is a form of interim report of the Council in addressing the tasks assigned by the Executive Order and some other, related tasks that the Council has undertaken.

The Executive Order established the scope of the Council to advise and assist the Governor and the Department of the Environment in:

(1) Coordinating the efforts of the State to facilitate the implementation of the recycling goals at the State and county level;

(1) Identifying local, national and international markets for recycling materials;

(3) Determining the need to expand or construct recycling centers;

(4) Developing rules and regulations for recycling the solid waste stream;

(5) Determining the programs necessary to educate the public on the need to participate in recycling efforts;

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(7) Evaluating State procurement policies for the purchase of recycled materials;

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"In carrying out this charge, the council should meet quarterly the first year. Committees should be formed to address specific issues. Recommendations made by the Council should be accompanied by specific evaluation as to the impact on economics, environment, and other methods of waste disposal, as well as obstacles to implementation."

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- *Identifying local, national and international markets for recycling materials:* The results of the Council's review of the Maryland Department of the Environment contractor's study on markets for recycled materials was submitted.

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All of the above were interim reports. It is planned that these subjects will be revisited and, it is anticipated, additional recommendations in each category will be made. During the first year, groundwork was laid for several other of the items in the assignment to the Council. Specifically:

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APPENDIX I

COUNCIL ROSTER
1990

State of Maryland

Governor's Advisory Council on Recycling

1990 Roster

Harvey Alter, Ph.D. - Chairman 10 Watchwater Way Rockville 20850-2742 Phone: (O) 202-463-5531	General Public 3 years from 11/1/89
Michael A. Gagliardo 4812 Holder Avenue Baltimore 21214 Phone: 333-2730	N.E. Maryland Waste Service 3 years from 11/1/89
Lawrence J. Hayward 8512 Valleyfield Road Lutherville 21093 Phone: 437-1111	Packaging Industry 3 years from 11/1/89
Paul Hollinger 55 Raisin Tree Circle Pikesville 21208 Phone: 247-5656	Packaging Industry remainder of 2 years from 11/1/89
George T. Hudnet 9620 Trepid Road Baltimore 21236 Phone: 684-3334	Solid Waste Industry 1 year from 11/1/89
James F. Katcef 3129 Catrina Lane Annapolis 21403 Phone: 224-2391	Food & Beverage Industry 2 years from 11/1/89
Lenny D. Minutillo, Jr. 18028 Bacon Road White Hall 21161 Phone: 327-6500	Food & Beverage Industry 1 year from 11/1/89
Dan K. Morhaim, M.D. 422 Garrison Forest Road Owings Mills 21117 Phone: 682-7046	General Public 3 years from 11/1/89

Appendix 1
Governor's Advisory Council on Recycling
Roster

The Hon. Regina J. McNeill
Councilwoman
Town of Berwyn Heights
6303 Pontiac Street
Berwyn Heights 20740
Phone: 953-9660

Maryland Municipal League
2 years from 11/1/89

Ronald Nelson
Director
Hazardous and Solid Waste Management Administration
2500 Broening Highway
Baltimore 21224
Phone: 631-3304

Dept. of the Environment
3 years from 11/1/89

Michael J. Pelczar, Jr. Ph.D.
Avalon Farm
P.O.Box 133
Chester 21619
Phone: 643-5142

Environmental Community
1 year from 11/1/89

George G. Perdikakis
4812 Holder Avenue
Baltimore 21214
Phone: 974-7281

MD Environmental Service
3 years from 11/1/89

The Hon. Joan B. Pitkin
Maryland House of Delegates
208 House Office Building
Annapolis 21401
Phone: 841-3098

House of Delegates
1 year from 11/1/89

Thomas W. Redmond, Sr.
8224 Baltimore Annapolis Blvd.
Pasadena 21122
Phone: 437-1111

Recycling Industry
2 years from 11/1/89

The Hon. John W. Schafer
Harford County Council
910 Rock Spring Road
Bel Air 21014
Phone: 838-4246

Maryland Association of Counties
2 years from 11/1/89

Appendix 1
Governor's Advisory Council on Recycling
Roster

Barry F. Scher
5417 Marlin Street
Rockville 20853
Phone: 341-4710

MD Food Dealers Association
2 years from 11/1/89

The Hon. Gerald W. Winegrad
Maryland State Senate
401 Senate Office Building
Annapolis 21401
Phone: 841-3578

Maryland State Senate
1 year from 11/1/89

APPENDIX II

Attendance of Council Members 1990

The attendance of the members is listed as the number of meetings attended/number of meetings they were elegible to attend during 1990.

Dr. Harvey Alter 11/12
Michael Gagliardo 12/12
Lawrence Hayward 7/12
Paul Hollinger 4/4
George Hudnet 7/12
James Katcef 12/12
Regina McNeil 8/12
Lenny Minutillo 6/12
Dan Morhain 9/12
Michael Pelczar 8/12
George Perdikakis 7/12
Joan Pitkin 5/12
Thomas Redmond 10/12
John W. Schafer 9/11
Barry Scher 8/12
Gerald Winegrad 7/12

APPENDIX III

WORK PLAN - 1990

April 2, 1990

PLAN OF WORK
1990

State of Maryland

Governor's Advisory Council on Recycling

1.0 Introduction

This plan presents the work schedule adopted by the Council to address the recycling questions assigned by Governor William Donald Schaefer and other points the Council wishes to include. The schedule is for 1990. An amended plan will be adopted for 1991 later this year.

There are three categories of questions or tasks the Council is undertaking: (1) the Governor's assignment; (2) some short term subjects that will demonstrate the State's leadership by reducing the amount of waste discarded by State executive and legislative branch offices and improve recycling; and (3) long term goals and strategies for increasing and improving recycling in Maryland. The Governor's assignment (contained in the Executive Order creating the Council) encompasses the pressing problems likely to be encountered during start-up of any recycling program.

Many of the tasks are inter-related so that the Council can not assign independent priorities to them. Some tasks cannot be addressed until the counties[1] submit their recycling plans to the Department of the Environment (The plans are due by July 1, 1990.)

This Work Plan discusses the tasks from the Governor and those added by the Council. The latter are classified as short-term and long-term. All are described below. A section of the Plan describes the time schedule the Council has adopted for 1990 for many of the tasks.

An important high priority task is omitted from the Work Plan discussion, at present. This task is to establish base-lines from which progress in recycling can be measured. There are no generally accepted models for computing waste composition, recycling potentials, nor the level of activity needed to meet the State's mandated recycling goals. There should be standardized baselines of quantity and composition of municipal solid waste (MSW) for urban, suburban and rural areas. Even if these are not exact, everyone should be counting from the same base. Better statistics are needed on just how much MSW is generated in the State, which is different from the total amount of solid waste going to disposal. The approach to this task will be planned (and may displace some other tasks on the schedule) after the counties submit their recycling plans. It is expected that some or all of the information needed will be included in the plans.

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1. References to counties in this plan include Baltimore City.

Another omission is the consideration of new recycling initiatives. The Council will consider these as part of all other assignments and when new initiatives are proposed by Council members or others.

2.0 Organization and Method of Operation of the Council

The Council will address the Governor's assignments concurrently with other tasks. To do this, small working groups or Task Forces will be organized for each task. When a Task Force finishes its report to the entire Council, the members will be available for other assignments.

The Council seeks input from all sectors across the State: public, private, citizens -- anyone who has something to contribute. The Council wishes to develop a broad consensus on what has to be done. Inquiries and discussions have begun to learn what the State, counties and the private sector are doing or plan to do to increase recycling in Maryland. Invitations will be issued by the Council, and through its representatives of the various public and private sectors, for recommendations and suggestions.

The public must be informed of progress. This will be coordinated through the Governor's office.

3.0 The Governor's Assignments

3.1 *Coordinate State Efforts to Facilitate Implementation of Recycling Goals at the State and County Levels:* This task must be considered by itself and in conjunction with all other assignments. The Council as adopted a continuing function to monitor recycling activities around the State. Staff has been asked to prepare periodic summaries of these activities, which will be made available widely. The Council's present consideration of tasks in paragraphs 4.1.1 and 4.1.2 are an initial effort to increase coordination among State offices and agencies, including the General Assembly.

3.2 *Identify & Evaluate Markets:* Most markets for recovered materials are strong; some are not likely to be satiated in the foreseeable future. The markets for office and computer papers, steel or aluminum cans, PET and HDPE plastics, and to an extent glass, are strong.[1] (The caveat for glass is because of the freight costs for the relatively low value product. Many parts of Maryland are close to glass plants.) Conventional wisdom is to worry because markets for old newsprint (ONP), tires, batteries, mixed papers and compost are weak. There is never likely to be a strong market for mixed papers for good technological reasons. Compost is a soil adjuvant, not a nutrient, and never has had high value anywhere in the world. Its selling price is low or negative, a situation unlikely to change. The limitations on the markets for discarded tires and batteries are different and will be addressed in part as part of two of the long-term tasks.

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1. A caution is needed here. The steel industry is assisting finding markets for steel cans but there is a surplus of scrap steel from other sources. Cans and some other grades of scrap steel compete for uses.

All over the country, people involved in recycling try to "identify" markets but do not often extend their vision to issues of marketing and specifications. Other factors that must be addressed in this context are the pricing mechanisms (guarding against upside and downside fluctuations), stability, interstate/intrastate competition and export opportunities.

It is important to recommend to the counties what is in the literature on markets and marketing. The recently completed State "market study" will be the starting point for discussions. The Council also will address the possibility of a centralized marketing function for recovered products.

The counties will likely be bidding against each other for available markets. There would be a great duplication of effort as each county attempts to establish a marketing function. The learning curve will be steep, expensive and time consuming. What merit would there be for the State to create a centralized function and sell all recovered materials as if from one source? Rather than have the State establish and maintain this new function, and recognizing that marketing and selling of products is not something the public sector does well, what are the merits of having the private sector market the recovered materials? This could be by public bid by recognized brokers and dealers. An incentive could be built-in by paying a percentage commission on sales rather than a fee. (At start-up, there could be a fixed-fee plus percentage to account for the fixed costs of start-up.) A private, established broker could conceivably better distribute the products from county programs in national and world markets, blending with traditional materials as necessary.

3.3 *Need to Expand/Construct Recycling Centers:* What constitutes a recycling center -- as opposed to a Materials Recovery Facility (MRF)? Which are needed, where? Some processing of separately collected materials is necessary in order to meet buyers' specifications. The State must be covered by a collection network feeding to aggregation centers (collection and transfer points) and there to MRFs for processing and to benefit from economies of scale. The collection quantities and locations are related to the nodes of waste generation and must accommodate rural and urban communities. This description lends it self to an operations research analysis for siting aggregation centers and MRFs and for achieving efficient regionalization. Some study is needed but this cannot be determined until the counties submit their recycling plans.

The operations research approach must include estimates of future quantities and grades of recyclable materials. For example, projections today show that the amounts of steel and glass packaging in MSW are dropping sharply. (So is paper packaging, which is not recyclable.) Plastics packaging is growing, but at a lower rate than other materials are dropping. How much will there be to recycle? Which housing densities will permit economical collection? Siting of MRFs and aggregation centers will be opposed (NIMBY). What can the State do to lessen NIMBY?

Are drop-off centers a way of expanding recycling? Some research shows that such centers have the lowest rate of participation. However, drop-off centers may be the only practical collection method in rural counties because they are compatible with current waste collection practices. Again, the counties' recycling plans must be submitted before this subject can be addressed.

3.4 *Development of Rules & Regulations for Recycling:* Two sets of rules will be needed: one for participants (starting with householders and small businesses) and another for processors and handlers of recycled materials. For the former, should there be a penalty for nonparticipation?

Should there be a penalty for the wrong materials? Should the State specify the types of containers? Who should determine the materials to be separated?

For the processors and handlers, will a State permit be required? Are there any new public health issues? Should there be any restrictions on where the materials to be recycled come from? If a MRF or aggregation center is operated by a county, should the permitting be any different than for the private sector? Are new laws needed regarding scavenging? Are regulations needed to protect public health?

What rules are needed to administer the State recycling law? How do we assure that all counties are keeping track of recycling percentages the same way? How do we ascertain that their recycling plans are comparable?

Will rules or regulations be required to specify which materials are to be recycled? At present, counties are planning to meet the mandated goals, which are based on weight. As a result, there is a natural tendency to ignore light weight materials, such as plastic containers. These containers make up only about two percent of MSW but there is a market for them. Will other materials be ignored if, for example, the mandated targets can be reached by recycling say yard waste?

3.5 *Programs to Maximize Participation:* If household source separation is required, should it be enforced? Is this a proper role for the police? Should enforcement be different for homeowners, businesses or government offices? Should counties be required to include specified materials in their plans, similar to some other states?

Can public information programs, which are essential in any case, be substituted for enforcement? Who should conduct them? (If government does, they are often ineffective, underfunded, and short-lived as legislatures scrutinize budgets.) What are appropriate measures of success: numbers of participants or quantities collected? Which methods of separation/collection and which containers receive the highest acceptance? What is the relationship between participation and demographics? (There are some data indicating higher participation correlates with higher education/income.) How do we achieve participation in high density dwelling units -- especially given health and fire regulations? What will be the participation at drop-off centers? How should recycling be conducted in low density rural areas? In areas without organized collection, should the residents be *de facto* excused from the recycling programs?

3.6 *Ways to Maximize State Procurement of Recycled Materials:* Given the present state of markets, should the State do anything? If they did, which products would be affected beyond certain grades of paper? How do you specify and differentiate between the use of secondary materials and secondary materials recovered from wastes destined for disposal. (Most products contain some secondary material.) Should the State adopt the Federal RCRA regulations here? Should they offer a higher price (say +10%)? What would it buy? For tires, what is involved in specifying road pavement with rubber-asphalt? How much more would it cost? What assurances can there be that any purchased product would assist Maryland markets?

It is unlikely that State procurement could generate much of a market for recycled materials (with the possible exception of paper, presuming specifications are clear to include post-consumer

stocks). However, should the State take actions with symbolic value to lead the way? If so, which actions would make sense in their own right and not just add cost?

3.7 *Evaluate Programs for Waste Reduction:* Any discussion of waste reduction must begin with recognition that the amount of waste generated *per capita* is not increasing; the fraction of packaging residues in MSW has gone down since 1972; metal and glass packaging weights have decreased over the years; packaging reduces the amount of food residues in MSW; all forms of packaging are decreasing except plastics, which is increasing slightly and has the greatest effect in reducing the amount of MSW.

What can the State do in its own operations to reduce waste? The Council started in February to address using double-sided copying and lighter weight bond papers in State offices. How much waste reduction would this accomplish?

Can the State take any other waste reduction steps without being contrary to interstate commerce? Should the State educate people so that they can make waste reducing decisions? (For example, a large waste reducing consumer decision would be to use plastic grocery bags instead of paper, other considerations of trade-offs aside.)

3.8 *Economic Feasibility of Recycling Programs:* The first step is to properly define "avoided cost," the popular budget "item" for financing recycling. Too often, it has been taken to mean the avoided disposal (or tip) fee. Rather, it is the avoided marginal cost of disposal, often much less than the tip fee. Economic feasibility will be better understood when jurisdictions are on a true user fee basis.

The literature is not clear as to the costs of separate collection of recyclable materials. Some time-motion studies have been done but they can be criticized. More and better data are needed. Everyone could use an economic decision model. Should the State develop one?

3.9 *Cost/Benefit of Packaging Replacements:* The Council must start with consideration of paragraph 3.6. Add to that the finding that foamed polystyrene packaging (the common target of such proposals) occupies 0.2% or so of landfills and the subject seems absurd. Similar proposals around the country cannot be supported by the data. There are trade-offs and anyone dictating package design is likely to slow the technological advances that reduce waste.

Given all of this, do we do nothing or should there be a information program such as mentioned in paragraph 3.6? How do we examine the trade-offs of waste and package replacements, let alone the health and environment factors?

4.0 Additional Points the Council Wishes to Consider

4.1 *Short-Term Tasks*

4.1.1 *Recycling in State Offices:* Can we increase office recycling of newspapers and office papers? How much paper will be recycled this way? What investments will have to be made? How can glass, aluminum, and possibly other materials be included? How can this recycling be

coordinated with the counties so that the State and counties do not work at cross purposes? How will federal facilities be included?

4.1.2 *Waste Reduction in State Offices:* An often overlooked waste management technique is to reduce the amount of paper being deposited in office waste baskets. Also overlooked is that since 1960, books and magazines and office wastes have grown as a portion of the waste stream. However, office waste is less than 3% of MSW. (By contrast, newspapers have been about 6.8% on average since 1960.) The amount of office waste can be reduced by using double-sided copying and lighter weight bond papers. How much waste reduction would this accomplish? How much would it cost to phase in double-sided office copiers?

4.2 *Long-Term Tasks*

4.2.1 *Markets for ONP and Tires:* The markets for most materials likely to be recovered from MSW are strong except for a few materials. Two outstanding exceptions are old newsprint (ONP) and discarded tires. The markets for these two might be integrated. Many firms are now investigating new de-inking mills for ONP. Should the State do what it can (*e.g.*, through its economic development program) to attract one of these mills? Further, these mills are large users of steam and power that could be generated by captive power plants burning coal and tires. Discussions have already started between the State and possible owner-operators of ONP de-inking mills. Predictions are that in about three to four years, new mills will be on-line and the market for ONP will be strong. If so, does the State have to do anything?

4.2.2 *Lead-Acid Storage Batteries:* The third material for which markets are poor are old lead-acid storage batteries. There is no shortage of demand for the lead, nor for the polypropylene cases. The barrier appears to be siting, given the future Superfund liability of an operator. The situation could get worse with passage of new Federal legislation. A bill recently introduced in Congress would require sellers of batteries, at all levels, to take back old ones. Something will have to be done with the batteries. What can the State do to attract a battery recycler? Perhaps just leasing the land for a plant and holding the lease holder harmless for future Superfund liability would be enough. (These plants are subject to RCRA Subtitle C corrective action so it is unlikely there would be any environmental insult.) Hold harmless may not be important environmentally; it may be essential to attract a plant. What is involved? Batteries from Maryland would have to be first in the queue for the recycling plant.

4.2.3 *Advancing MRF Technology:* Recycling programs will require the building and operation of materials recycling facilities (MRFs) to prepare separated products for markets. The products as-collected do not meet buyers' specifications. Current MRFs are labor intensive, with little mechanical processing. OSHA and related state agencies apparently have not taken a close look at these operations, which too often are built on shoe strings and present risks to workers. Picking garbage is not pleasant work. The future prospects for hiring laborers for this type of work are poor given current demographics of the work force, short of large future immigration. What can the State do to encourage new technology and capital--, rather than labor--intensive separations? Is a model regional MRF a way? Should the State pay for the design of a modern MRF and make this available to the counties? Should this be extended to building the first one, and thus demonstrating the technology in the State? Can this be accomplished by a full service operator (which is the way

modern waste-to-energy plants have been built and successfully operated). Should the State encourage a regional MRF to lead the way? If so, what would be the best way of doing this, short of funding the entire design and construction, even operation?

4.2.4 *Overlooked Wastes:* There are some large quantity, homogeneous wastes that are often overlooked when discussing recycling programs: old license plates, last year's telephone books, and the asphalt paving or roofing from demolition. Old license plates probably do not amount to much waste disposed, but the aluminum is valuable. Should the Motor Vehicle Administration require citizens to return voided plates? How can we organize to avoid old telephone directories from being sent to landfills? Judging from current I-270 construction, there is some asphalt recycling in Maryland. What of other road demolition wastes? What happens to old roofing wastes? Which other wastes are being overlooked?

5.0 Ongoing Tasks

5.1 *Introduction:* Some tasks are considerations that must be included in discussion of all other tasks. In addition to paragraph 3.1, three others are described below.

5.2 *Informing the Public as to Progress:* The Council has an obligation to keep the public informed about what its deliberations, including open meetings and opportunities for public outreach. The Council reports to the Governor who will be consulted as how best to inform the public.

5.3 *Recommendations of New State Initiatives:* Paragraphs 4.2.1 and 4.2.2 are for new State initiatives. Throughout the Council's deliberations, it must be sensitive to other initiatives.

5.3 *Education:* The Council has to address what can be done within the education system to teach a waste management ethic. There are school curricula for K-12 and perhaps the State can encourage their use. There is little related course work in colleges and universities. Should the Maryland universities and colleges be encouraged to develop undergraduate and post-graduate courses in the field?

6.0 The Schedule for 1990

Two charts are appended. The first presents a schedule for addressing the eight of the tasks assigned by the Governor. (Task 3.1 pervades all other considerations, so is not listed separately on the chart.). The second is a schedule for addressing some of the points proposed by the Council. Note that tasks from each category will be addressed concurrently.

The Charts show three types of activities: discussion by the full Council, assignments for Council Task Forces, and Recommendations formulation. Not all tasks have the three types of activities during 1990. This is because either there is not enough time or because the tasks cannot be addressed until some other information is available, such as the county recycling plans.

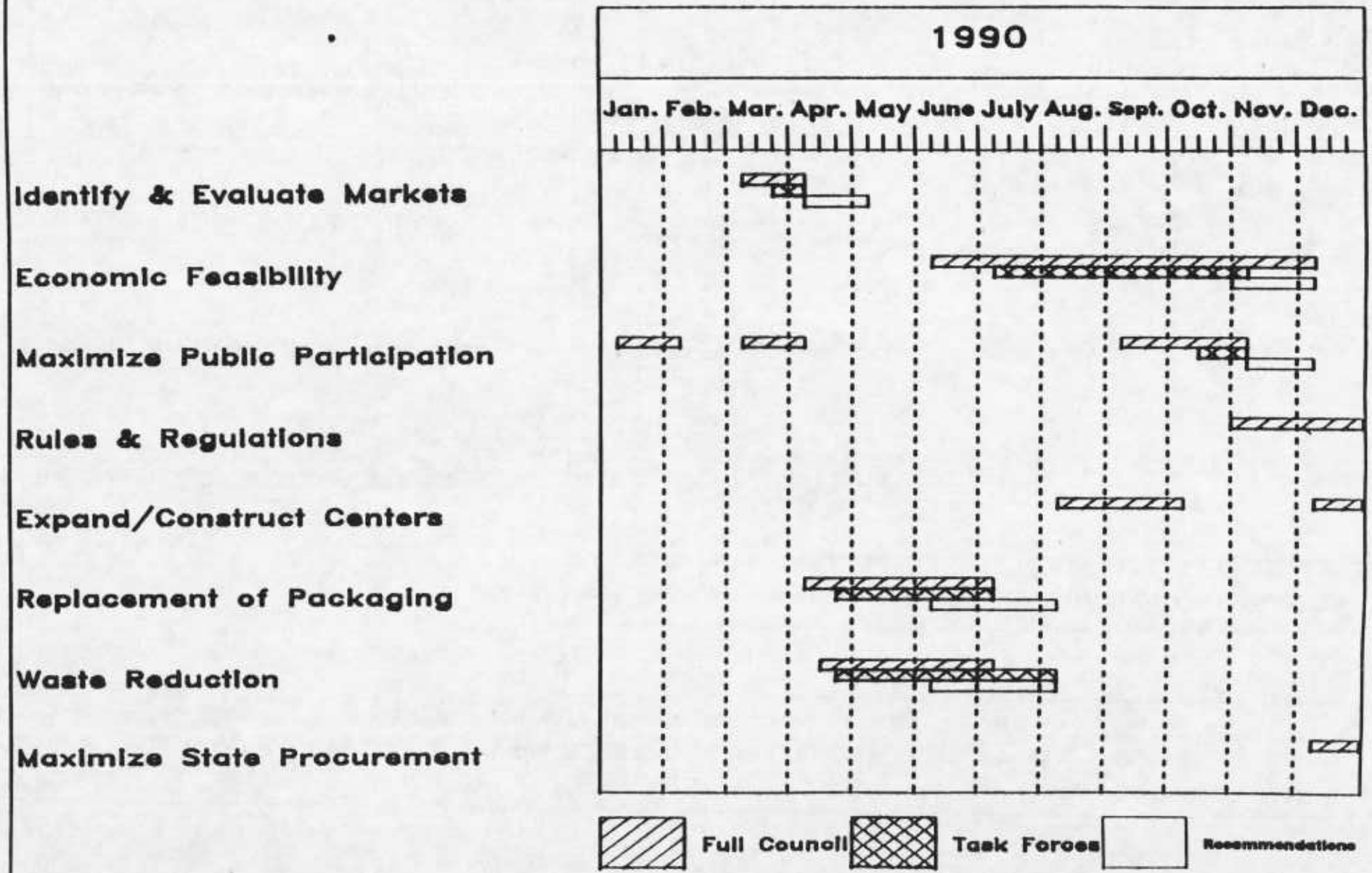
No schedules for beyond 1990 have been formulated. Probably, some of the tasks planned for 1990 will not be completed and will carry over. In all likelihood, the Council will want to address additional tasks in subsequent years. These schedules will have to be updated periodically.

Some aspects of the schedules need to be highlighted. Note that economic feasibility cannot be fully addressed until the county plans have been submitted. Maximizing State procurement is scheduled for the end of 1990 because this subject can wait compared to others that will more directly influence implementation of the county plans. Consideration of recycling and waste reduction in State offices has begun, so these subjects are scheduled early. Discussion of advancing MRF technology is left until the end of 1990; much has to be learned about the subject before meaningful discussions can be held.

The schedules are ambitious and subject to change.

Governor's Advisory Council on Recycling

Schedule of Assigned Tasks



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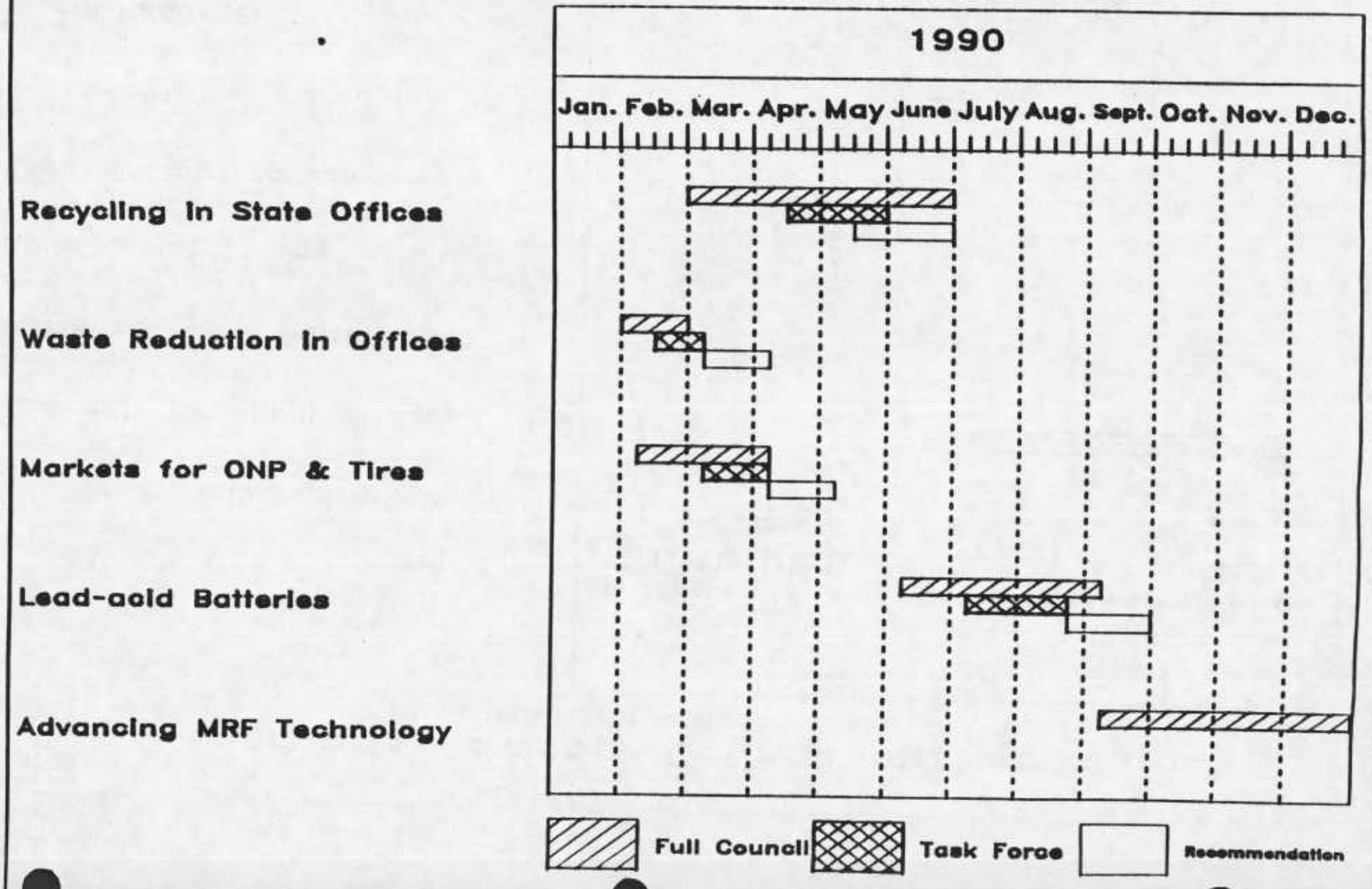
Governor's Advisory Council on Recycling

Schedule of Short & Long Term Tasks



APPENDIX IV

PAMPHLETS ON:

Guide to Buying Recycled Products
Guide to Waste Audits for Waste Reduction
Guide to Office Recycling

State of Maryland
Governor's Advisory Council on Recycling

GUIDE TO BUYING RECYCLED PRODUCTS

The Maryland Recycling Law establishes goals of 20% recycling in the seven largest counties and 15% in the smaller counties by 1994. While the goals of the law are laudable, they will not succeed unless markets for recovered materials can absorb the new supply.

The term "recycled product" is used here to mean a product made in all -- or part -- from secondary material that has been recovered from manufacturing or post-consumer waste. Alternatively, "recycled product" may mean a product that has been rebuilt, such as a rebuilt engine.

Recycling involves three elements: collection, manufacturing and use. (These are represented by the three arrows in the traditional recycling symbol.) The three elements must be in balance to fully realize the potential of a recycling program as a means of waste management, energy conservation, and resource conservation. Merely collecting "recyclables" is not recycling. Recycling does not occur until the recovered materials are returned to the economic mainstream.

According to the National Institute of Governmental Purchasing, government purchases represent from 20 to 21% of GNP (7-8% federal, 12-13% state and local). In addition, governments have an important role in influencing private purchases, both by example and by their standards and specifications.

Present Programs

At the federal level, Section 6002 of the Resource Conservation and Recovery Act (RCRA), requires purchasing programs for recycled products by federal agencies and by state and local agencies and contractors using appropriated federal funds. The U.S. Environmental Protection Agency (EPA) has published five guidelines for recycled paper and paper products, rerefined oil, retreaded tires, building insulation products, and cement and concrete made with fly ash. The guidelines describe specifications, minimum content standards, and recommendations on establishing a procurement program. EPA is also examining the feasibility of new guidelines for building and construction materials, rubber products, asphalt rubber and yard waste compost.

There are some 38 states and 16 local governments that have ordinances or regulations favoring the purchase of products containing recycled materials. In Maryland, current law

requires 40% of the state's paper purchases to be recycled paper (defined as paper containing 80% post-consumer waste). The law also requires State agencies to develop a plan to increase their purchases of recycled products. A new law passed by the General Assembly in 1990 requires a five percent price preference for such products.

Elements of a Recycled Product Purchasing Plan

Governments, businesses and non-profit organizations should establish programs to purchase products containing recycled materials. The National Recycling Coalition, a national public-private non-profit organization committed to increasing recycling, recommends several key elements of a recycled product purchasing plan. These are summarized below.

1. Commitment to Buy. Organizations must establish a policy to buy recycled products. This commitment will provide leadership to users, and convince suppliers that a consistent, long term demand exists.

2. Review Purchasing Specifications. Specifications should be reviewed to eliminate prohibitions or limitations of recycled materials. Subtle obstacles, such as brightness levels for paper, must be identified and reviewed.

3. Common Definitions and Percentages. Organizations should use existing minimum content standards and definitions. Manufacturers cannot supply different products to the 50 states, more than 83,000 local governments, or millions of private organizations. Standardized specifications enable manufacturers to offer commodity items at a lower cost than specialty items.

4. Variety of Products. Even though paper makes up the largest fraction of the waste stream, buying recycled paper alone will not solve the solid waste problem. Organizations should consider buying a variety of recycled products, including paper, oil, plastics, auto parts, compost, aggregate, rubber, and so forth. Organizations should also consider recycling services such as tire retreading and oil recycling.

5. Testing Products. Organizations should test recycled products to determine how they work on certain equipment and for particular end uses.

6. Phased-In Approach. It is wise to phase-in use of recycled products so that users can adjust to the program and manufacturers can make capital investments to produce products containing recovered materials.

7. Price Incentives. Recycled products initially may be more expensive than corresponding products made entirely from virgin materials. (Much of this has to do with the present short supply of certain secondary materials meeting necessary specifications.) The organizational commitment to use recycled products may be fulfilled by offering a small price preference to suppliers, by considering life-cycle costing, or establishing set-asides. Many public sector organizations have adopted price preferences as an investment in market development.

8. Cooperation Between Solid Waste and Purchasing Officials. Both solid waste and purchasing officials have expertise and experience that should be used to develop an effective program for buying recycled products.

9. Cooperation Among Manufacturers, Vendors and Users. Organizations must actively solicit bids from manufacturers and vendors of recycled products and widely publicize the bids. Manufacturers and vendors must be encouraged to provide a wide range of recycled products and let users know about them.

10. Cooperative Purchasing. Organizations should consider joining together to buy recycled products. Cooperative purchases expand the volume purchased, reduce unit costs, help ensure availability, and establish common specifications.

11. Waste Reduction and Recyclability. In addition to buying recycled products, organizations should buy recyclable products.

Sources of Assistance

The local recycling coordinator, solid waste manager or purchasing department can provide technical assistance. Further assistance is available from:

Northeast Maryland Waste Disposal Authority 25 Charles Street, Suite 2105 Baltimore, Maryland 21201-3330 301-333-2730	technical assistance information on suppliers
Maryland Environmental Service 2020 Industrial Drive Annapolis, Maryland 21401 301-974-7254 800-492-9188	technical assistance publishes the *Maryland Recycling Directory*
Maryland Department of the Environment Office of Waste Minimization and Recycling 2500 Broening Highway Baltimore, Maryland 21224 301-631-3315	technical assistance
U.S. Environmental Protection Agency Recycled Guideline Hotline c/o EH Pechan & Associates 5537 Hempstead Way Springfield, Virginia 22151 703-941-4452	information on federal procurement guidelines c/o and recycled product suppliers

State of Maryland
Governor's Advisory Council on Recycling

GUIDE TO WASTE AUDITS FOR WASTE REDUCTION AND RECYCLING

Waste generated in the home is only about one-half of the municipal solid waste stream. Businesses and public and private institutions (such as schools and government facilities) produce the other half. In order for Counties to meet the State's recycling goals, businesses must participate in recycling and waste reduction programs.

Waste reduction means avoiding the generation of waste. In addition to recycling, it includes several other actions.

- using supplies and equipment more efficiently
- replacing disposable materials with reusable and recyclable materials
- buying products and equipment that are durable or easily repairable or recyclable

Waste reduction is the most environmentally benign form of waste management. Unlike recycling or virgin production, there is no need to process or transport materials and the amount of energy and raw material used is reduced. The less waste produced, and requiring disposal, the more money is saved by governments and businesses.

Waste Audit

A waste audit will identify areas or activities where waste can be reduced. The audit identifies raw materials being used, waste composition, recyclable materials, and activities and procedures that can be changed so as to produce less waste.

A successful waste audit should include the following elements:

- naming a program coordinator to conduct the waste audit, get employees involved, track the progress of the program and solve problems
- developing waste reduction goals
- conducting a visual survey of materials in the trash
- identifying types and quantities of waste generated
- reviewing purchasing practices
- identifying waste reduction opportunities

Once the audit is complete, the waste reduction program must be implemented. This includes:

- establishing a waste reduction and recycling policy (See, for example, the suggested policy following this Guide.)
- publicizing the program
- training staff
- implementing the recommendations and publicizing the results
- evaluating and revising the program

A waste audit should be conducted at least once a year to ensure that the program is complete and up-to-date. The remainder of this text will focus on techniques to reduce waste generation.

Reducing Paper Waste

According to an EPA report, paper and paperboard represent the largest percentage of material discarded into the municipal waste stream, almost 40%. Office waste is about 10% of this and most of it is recyclable. How can paper waste be reduced? Listed below are some of the techniques.

- Use dual-sided copying whenever possible. Dual-sided copying can save up to 50% of paper purchases, reduce the need for new filing cabinets and file space, reduce mailing costs, and permit smaller mailing envelopes to be used.

- Use lighter weight papers whenever possible. Such papers are generally less expensive.

- Establish centralized filing systems to reduce the number of copies of documents.

- Use obsolete forms for drafts and memo pads. If no sensitive material is involved, the paper can be donated as drawing paper to child-care or similar facilities.

- Reuse interoffice envelopes, file folders, and corrugated boxes.

- Eliminate needless forms.

- Use central bulletin boards, the telephone, and staff meetings instead of sending memos.

Many organizations measure success by the length of their mailing list. Organizations need to communicate, but there are ways to reduce waste in doing so.

- Reduce mailing and distribution lists and reevaluate quantities needed for reports and publications.

- Share documents with other staff or agencies.

- Remove your name from mailing lists for materials you no longer need or share with others.

- Use electronic or computer mail.

Government and businesses can buy paper products that can be recycled in office wastepaper recycling systems. Switching to white ledger and white legal pads will increase the value of waste paper. You can replace plastic-window envelopes, which are rarely recyclable, with open-window envelopes. Mailing labels and other sticky products should be water soluble to permit recycling. Reports should be printed on non-glossy paper to allow excess material and

trim to be recycled. These techniques can improve the value of the wastepaper by eliminating contaminants.

The purchasing division should work closely with the records-management division on wastepaper recycling. The records-management division disposes of material after it remains in storage for a required number of years. They work with local recyclers and know which paper can be recycled profitably and which contaminants (glues, carbon paper, etc.) reduce the value of waste paper. Purchasing officials should use the information to assure that future discards are more recyclable.

Inventory Control

Public and private agencies should establish a computerized inventory control for the products they buy to avoid wasteful duplication. Agencies can share materials and buy in bulk quantities to reduce unit costs and consume less packaging.

Purchasing officials should cooperate in the inventory system and with their salvage bureaus. Salvage officials know which products can be reused or recycled. They can inform agencies of available products and suggest products that are easier to recycle. The salvage bureau can sell or donate usable equipment to other agencies, governments, citizens (through auctions), rebuilders, recyclers, and nonprofit organizations.

Influencing Manufacturers

Agencies can use their purchasing power and specifications to convince suppliers to reduce waste volume and toxicity. A specification for packaging can specify the use of recyclable paperboard or prohibit the use of inks that contain toxic metals (*e.g.*, lead or cadmium). They can require that manufacturers of automobile or truck batteries accept used units for recycling before the government will buy new ones.

Remanufacturing

More than five hundred U.S. firms are involved in remanufacturing, an industrial activity that collects discarded or nonfunctioning durable products, disassembles and refurbishes reusable parts, replaces other parts, and reassembles the parts into usable products. Examples of products that can be remanufactured include vehicles, vehicle parts, transformers, vending machines, tires (retreading), respliced computer paper, compressors, telephones, and many others. Organizations can buy remanufactured products and so reduce wastes.

Other Waste Reduction Techniques

Governments and businesses have other methods of reducing waste:

- Use life-cycle costing formulas that include product life and disposal costs to encourage recyclable, reusable, and durable products.
- Buy reusable pallets.
- Buying cloth towels or hand warmers instead of paper towels.
- Buy reusable wiping cloths.
- Use backhauling, where the vehicle making a shipment of finished products takes recyclable materials back to the manufacturer instead of returning empty.

State of Maryland
Governor's Advisory Council on Recycling

Suggested Organizational Policy

WASTE REDUCTION AND RECYCLING

In order to promote conservation, management is establishing this policy regarding materials reuse, recycling and waste reduction in all operations. To implement this policy, our organization will, to the extent practicable, undertake the following actions.

1. Purchase durable products, rather than disposable products.

2. Use two-sided copies.

3. Use recycled paper meeting, at a minimum, federal EPA guidelines, for all stationery, newsletters, copy paper, pads, business cards, and computer paper. A message to that effect will be stated on the paper when possible.

4. Use no inks containing toxic components for our publications.

5. Purchase and use recyclable paper for internal use and avoid colored or other papers that can not be recycled.

6. Use the back side of used paper or obsolete forms for scratch pads and first drafts.

7. Minimize the use of specified glues on products.

8. Use single copies with routing slips within the office whenever possible, rather than indiscriminate use of copies of memos.

9. Recycle paper, metal and glass.

10. Include a statement in all solicitations for bids for goods and services that this organization prefers doing business with companies that adhere to these principles.

11. Urge all employees, consultants and vendors to implement the above practices and follow the principles of waste reduction and materials reuse and recycling.

Your management will report annually on the success of everyone's efforts in reducing waste.

State of Maryland
Governor's Advisory Council on Recycling

GUIDE TO OFFICE RECYCLING

According to studies prepared for the United States Environmental Protection Agency, paper makes up nearly 40% of the municipal solid waste stream (after recycling). In a typical office, about 75% of the waste is recyclable paper (such as white and colored office paper, computer print-out, newsprint and corrugated), which can be recycled into new products. Office papers constitute about 10% of the total paper in the waste stream and have value as a recycled product.

The American Paper Institute has recommended a 40% recycling rate by 1995. An important part of achieving this goal will be collecting clean, source separated paper. Therefore, it is critical that public and private agencies establish office recycling programs.

While this Guide is specific to wastepaper (as the largest component of office generated solid waste), the same principles apply to recycling other office wastes such as metal and glass containers and cardboard.

Office recycling provides several benefits.

- generates revenue from the sale of recyclable materials
- reduces the amount of waste for disposal
- conserves energy
- provides raw materials for new products
- • can reduce disposal costs
- helps Maryland Counties reach their recycling goals

Wastepaper Programs

Office managers should follow these steps to establish an office wastepaper recycling program:

1. *Discuss the program with potential materials buyers.* Look in the phone book under wastepaper dealers or contact the resources listed at the end of this Guide. It is important to establish a contract with reputable secondary materials users, dealers or brokers.

2. *Obtain the support of upper level management.* Once you know that a market exists for the paper, ensure that the program has the support of the chief executive and other key policy makers of your organization. This will help gain maximum participation by all concerned.

3. *Determine the number of people who will participate and the types and amounts of paper that will be generated.* A good rule of thumb is that each employee in an office generates approximately one-third to one-half pound of paper per day. The selection of paper to be recycled will depend on local market conditions and the specifications in your sales contract, both of which are determined (in part) by the types of paper being used in your office.

It is critical that the highest possible grades of paper are collected. It may not be advantageous to collect mixed paper for recycling. While doing so has the advantage of removing the largest volume from the waste stream, mixed paper has a much lower value than separated paper, and will not help the long-term goal of providing wastepaper needed by mills to make high quality printing, writing, tissue and towel products.

Start programs after a demonstration period so as to identify and correct potential problems before involving all employees in the program. A new large, ambitious program that doesn't work will diminish enthusiasm and participation.

4. *Determine how employees will separate their recyclable paper from other wastes.* The most common methods are the desk-top collection container, a second trash can, and central collection areas. Separation is important to avoid contamination, which reduces the value of the paper. Each collection receptacle should include a recycling logo or other clear identifier, and should list acceptable and unacceptable items for recycling.

5. *Decide how paper will be collected and stored.* Most systems use central boxes where employees place separated paper. The employees place the paper in the containers when leaving the building for lunch, meetings or at the end of the day. The boxes are then

collected by janitorial or other personnel and placed in a central area for shipment to a paper dealer. The boxes should be clearly identified as recycling containers to avoid contamination.

6. *Establish the cost of the program.* Determine whether you or the wastepaper dealer will pay for such items as the desk-top units or other collection devices, the cost of boxes and pallets, and the cost of training. Determine the approximate value of the paper and estimated savings on disposal costs, including transportation (if any) to estimate the net cost or savings from the program.

7. *Negotiate a firm contract with a wastepaper dealer.* The contract should include which costs are borne by the dealer and which are your responsibility, grades to be collected, the method of pricing the paper, how the paper will be weighed, how often it will be collected, the allowable level of contaminants and outthrows, and the method of payment. Prices for wastepaper fluctuate due to changes in market conditions. These price fluctuations must be considered in developing the contract and net costs. Contracts can protect both buyers and sellers against severe fluctuations by establishing a floor price when the market is down, and a discount when the market is up.

8. *Coordinate your collection program with your purchases.* Buy only those products that can be recycled. Avoid items that are excluded by your buyer's specifications. These may include yellow legal pads, glossy papers, window envelopes, sticky labels and similar contaminants.

9. *Establish a coordinator for the program.* The coordinator will work with the wastepaper buyer(s) and employees to ensure smooth program implementation. Depending on the size of the program, it may be useful to have area monitors to assist the program coordinator in keeping participation rates up and contamination levels down.

10. *Make sure that all employees are trained.* The program will succeed only if every employee, from the chief executive to the lowest paid employee, understands the importance of recycling and is motivated to participate. A well publicized kickoff meeting, with a 15-20 minute training session (including program need, goals, collection methods, and acceptable and unacceptable items) is critical. Training must continue even after the program begins (with frequent reminders to employees). New employees should be trained as part of regular orientation programs.

11. *Publicize the success of the program.* This will encourage increased participation and enthusiasm and provide reliable information to convince other organizations to establish similar efforts.

State of Maryland
Governor's Advisory Council on Recycling

SOURCES OF ADDITIONAL INFORMATION AND TECHNICAL ASSISTANCE

Source	Assistance
Local Recycling Coordinator	Technical Assistance
Local Solid Waste Department	Technical Assistance
Local Purchasing Department	Technical Assistance
Northeast Maryland Waste Disposal Authority 25 South Charles Street Suite 2105 Baltimore, Maryland 21201-3330 (301) 333-2730	Technical Assistance
Maryland Environmental Service 2020 Industrial Drive Annapolis, Maryland 21401 (301) 974-7254 (800) 492-9188	Maryland Recycling Directory (markets information) Technical Assistance
Maryland Department of the Environment Office of Waste Minimization and Recycling 2500 Broening Highway Baltimore, Maryland 21224 (301) 631-3315	Technical Assistance Market Survey

State of Maryland
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U.S. EPA Solid Waste Information 401 M Street, S.W. Washington, D.C. 20460 (800) 424-9346	Technical Assistance
National Recycling Coalition 1101 30th Street, N.W. Suite 305 Washington, D.C. 20007 (202) 625-6406	Peer Match Program (technical assistance, up to 50% of travel cost for advisor)
Institute of Scrap Recycling Industries 1627 K Street, N.W. Washington, D.C. 20006 (202) 466-4050	PS-90-Specifications for various wastepaper grades, Information on paper dealers ($10)
Mill Trade Journal South 105 Fairview Avenue Paramus, New Jersey 07652 (201) 368-1225	Wastepaper Prices
Fiber Market News 4012 Bridge Avenue Cleveland, Ohio 44113 (216) 961-4130	Wastepaper Prices

State of Maryland
Governor's Advisory Council on Recycling

Harvey Alter, Ph.D.
Chairman

Hon. William Donald Schaefer
Governor, State of Maryland
State House
Annapolis, Maryland 21401

Dear Governor Schaefer:

It is my privilege to forward the second annual report of your Advisory Council on Recycling. The Council continues to make progress toward offering advice on all of the subjects required in your Executive Order establishing the Council.

Your appointments to the Council at the end of 1989 established the group for a period of three years. It is our judgement and plan that our work will be completed by the end of 1992, on schedule. We further anticipate that additional interim reports will be forwarded during this calendar year.

The Council will be pleased to elaborate on any of the items mentioned in the 1992 Annual Report.

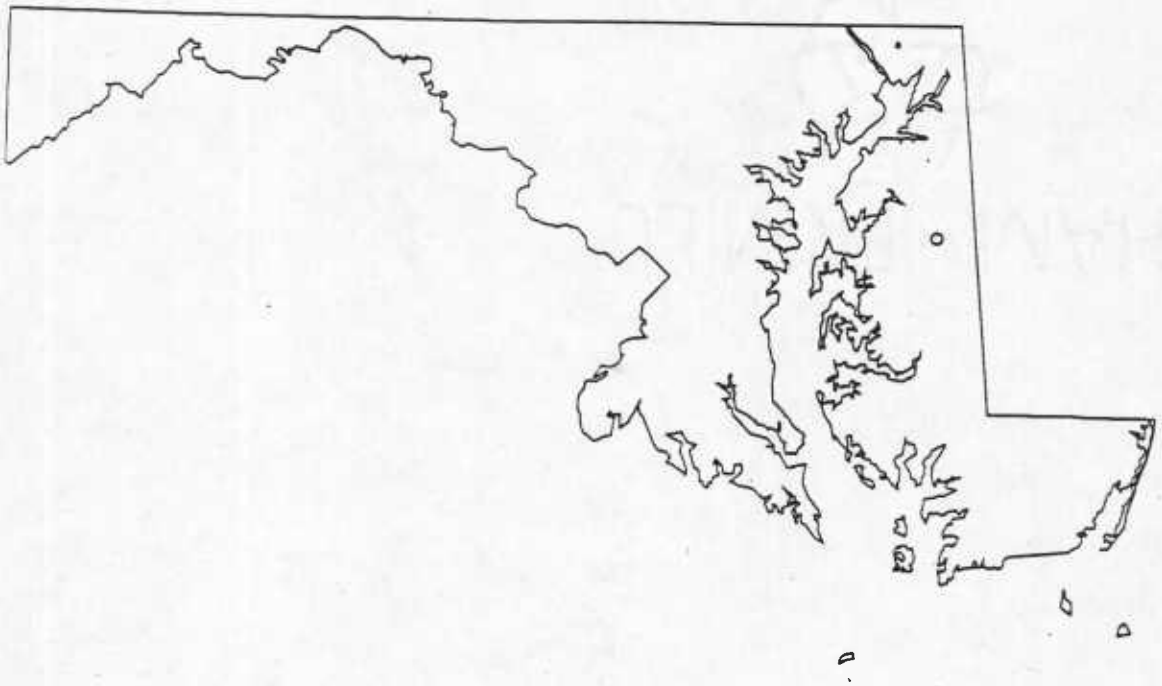
Sincerely,

Harvey Alter, Chairman

cc: Hon. Robert Perciasepe
Mr. Gerald L. Thorpe
Members of the Council

State of Maryland

Governor's Advisory Council on Recycling



Annual Report

1991

State of Maryland
Governor's Advisory Council on Recycling

Annual Report to the Governor
1991

Introduction

The Governor's Advisory Council on Recycling was established by Executive Order 0.01.01.1989.08 by Governor William Donald Schaefer. Members were asked to serve on November 1, 1989. A roster of the members for 1991, the organizations or positions they were chosen to represent, and the length of their terms, is included as Appendix I.

This is the second annual report of the Council. As such, it is a form of interim report of the Council in addressing the tasks assigned by the Executive Order and other related tasks that the Council has undertaken.

The Executive Order established the scope of the Council to advise and assist the Governor and the Department of the Environment in:

(1) Coordinating the efforts of the State to facilitate the implementation of the recycling goals at the State and county level;

(1) Identifying local, national and international markets for recycling materials;

(3) Determining the need to expand or construct recycling centers;

(4) Developing rules and regulations for recycling the solid waste stream;

(5) Determining the programs necessary to educate the public on the need to participate in recycling efforts;

(6) Determining the programs necessary to reduce the amount of solid waste generated for disposal;

(7) Evaluating State procurement policies for the purchase of recycled materials;

(8) Researching the economics and financing of existing and proposed systems of solid waste recycling; and

(9) Determining the costs, benefits, and effects of replacing certain packaging materials used in commerce with other recyclable materials and the role of these materials in recycling efforts.

Per the Executive Order, the Council is instructed to report to the Governor annually and interim reports are to be provided as necessary. This is the second annual report. Interim reports (referred to later) were submitted by letter to the Governor.

The Governor's letter of appointment to the Chairman included:

"In carrying out this charge, the council should meet quarterly the first year. Committees should be formed to address specific issues. Recommendations made by the Council should be accompanied by specific evaluation as to the impact on economics, environment, and other methods of waste disposal, as well as obstacles to implementation."

Further, a work plan was requested.

Organization and Meetings of the Council

At its first meeting on January 3, 1990, the Council decided to meet monthly, rather than quarterly, in order to carry out their mandates. Further, instead of specific committees, the Council agreed that task groups would be formed as necessary to address each of the nine points in the scope as well as related matters as the Council may identify. In this way, members could be involved at the earliest point in addressing more than one point of the scope and could be assigned to other points as portions of the scope were completed.

During 1991, the Council met every month, generally from 9:00 a.m. to noon on the first Monday of the month. Attendance was high, as listed in Appendix II.

The Council Work Plan

In accord with the Governor's request, and in order to plan the Council's activities, considerable effort was expended in the first few meetings to develop and approve a work plan. (During this time, the Council concurrently proceeded with discussion of other items within its charge.) Many of the items in the work plan had to be scheduled to fit in with the State's requirement that the counties submit recycling plans prior to July 1, 1990 and that the Department of Environment had already commissioned a contractor's study to identify local, regional and international markets for recycled materials.

The Council's work plan set out a schedule to address the nine points in the Governor's assigned scope and other matters viewed as pertinent. A copy of the 1991 work plan is included as Appendix III.

Interim Reports

Interim letter reports were submitted to the Governor on during the year. The points of the Executive Order addressed and the subjects covered were as follows:

- *Programs Necessary to Educate the Public on the Need to Participate in Recycling Efforts: Part 1: School Programs.* This report addressed possible new programs for grades K through 12 and for university undergraduate and post-graduate education.

- *Costs, Benefits, and Effects of Replacing Certain Packaging Materials Used in Commerce with Other Recyclable Materials: Part 1: Package Bans, Taxes and Deposits. Discussion and Recommendations.* This report addressed the possible effects of package bans, taxes and deposits on recycling programs.

- *Economics and Financing of Existing and Proposed Systems of Solid Waste Recycling and Facilitating the Implementation of Recycling Goals. Stimulating recycling at the Margin.* This report addressed means of stimulating recycling activities. An egalitarian waste disposal fee as a means of paying for programs was discussed and dismissed. A number of methods of stimulation were recommended that would rely on the use of existing state funds to supplement county programs, hence "at the margin."

- *Purchase and Use of Recycled Products.* This is a comprehensive review of current government activities in the state for purchase of recycled products and recommendations how the various existing programs may be broadened. In this way, Maryland can assist in increasing the demand pull for such products.

- *Miscellaneous Steps for Stimulating Recycling.* This short report recommended fifteen steps that can be taken to stimulate and increase recycling in the state.

All of the above were interim reports. It is planned that some of these subjects may be revisited and it is anticipated that additional recommendations will be made.

Outside Resources Consulted

During the course of the year the Council saw fit to invite outside experts for advise and counsel. These were: a representative of the Council of Northeast Governors (CONEG) Waste Reduction Project to discuss CONEG's proposed waste reduction legislation; a representative from the State of Pennsylvania Department of Natural Resources to discuss Pennsylvania's recycling program; and a representative from the consulting firm of Gershman, Brickner & Bratton, Inc. to review state legislation in Florida, New Jersey and Wisconsin.

The Council also benefited from several outside interested parties attending and contributing to many of the Council's discussions. Many others were consulted by the various Task Groups that were formed.

Summary of Subjects Discussed by the Council and Tentative Conclusions

Some of the key subjects discussed by the Council, which may be considered as work

in progress, are listed below.

Methods of financing existing and proposed systems of solid waste recycling was discussed and an internal memorandum prepared. This memorandum served as a starting point for continuing discussion of the subject.

Methods of waste or source reduction were reviewed. Examples of new types of reduced secondary or distribution packaging were presented.

Progress in the counties in submitting their required recycling reports, and the programs they have in place, were reviewed.

The Council discussed the forthcoming state tire recycling requirements and reviewed the burning of old tires in cement kilns.

The November 1991 meeting was devoted to a tour of the new Montgomery County Materials Recovery Facility (MRF).

Specific Recommendations

In late-1991, the Governor requested a brief summary of the Council's activities to date. This is included here as Appendix IV.

Future Activities

Many of the specific charges in the Executive Order forming the Council are on-going tasks. Interim reports will be issued at appropriate times.

Revisions in the Work Plan for calendar year 1992 were begun in September 1991 during an all day meeting of the Council.[1] The following activities are planned:

- **Recycling as an Economic Development Activity.** The Hon. Marc Wasserman, Secretary, Department of Economic & Employment Development, or his designee, has been invited to address the Council early 1992.

- **The Role of Small Businesses in Recycling.** Mr. Stanley Tucker, Executive Director, Small Business Development Financing Authority, has been invited to address the Council early 1992.

[1]The Council's September 1991 meeting was expanded to a full day. Half of the day was spent on planning, both modifications to the Work Plan and identification of priority issues beyond those in the Executive Order. The Council was able to hold this meeting at the Department of Natural Resources Conference Center on Wye Island.

• **Regionalization of Recycling Activities.** The Hon. Tom Duncan, Talbot County Council, a member of the Council, is organizing a program for the Council to discuss regionalization. The emphasis of the discussion will be on what works, rather than on all the reasons regionalization does not work.

• **Possible Legislative Approaches.** The Hon. Gerald Winegrad, State Senator, and a member of the Council, is heading a task force leading to recommendations from the Council as to possible legislative approaches for increasing recycling in the State of Maryland.

• **Cooperation with National Recycling Programs.** A presentation is planned in May from Keep America Beautiful (KAB) to learn what would be involved for Maryland to be another state in their national program for improving and increasing recycling and litter reduction. One member of the Council (Barry Scher) is a member of the Board of Directors of KAB and another (Chairman Harvey Alter) is a member of the KAB National Advisory Council and Solid Waste Committee.

• **Subjects Still to Be Completed:** The following subjects and underway and will be completed during the course of 1992: economics and financing of recycling; product deposits; stimulating the construction of MRF's; rules and regulations for recycling; commercial waste recycling; and improving public information, particularly what we may learn from apparently the most successful program in the country, in Delaware.

Council Member Attendance During 1991

Appendix II is a report of Council Member attendance. It is judged to be extraordinarily high. Ms. Regina McNeil attended three times but had to resign when she relinquished her position representing the Maryland Municipal League. Dr. Michael Pelczar had resigned from the Council and then was reappointed. Allowing for the interim period, Dr. Pelczar's attendance was near perfect.

Acknowledgement

The Council acknowledges, with thanks, the excellent professional staff assistance from the Maryland Department of Environment.

LIST OF APPENDICES FOLLOWING

I. Roster and Tenure of Council Members

II. Report of Attendance of Council Members

III. Plan of Work for 1991

IV. Summary Report of Council activities from inception to September 1991v

Governor's Advisory Council on Recycling
Tenure of Members

*	Dr. Harvey Alter Chairman Manager, Resources Policy Department U.S. Chamber of Commerce Represents the general public	3 years from 11/1/89
*	The Honorable Thomas G. Duncan Talbot County Council Courthouse Represents the Maryland Association of Counties	2 year from 11/1/89*
*	Mr. Michael Gagliardo Executive Director Northeast Maryland Waste Disposal Authority Represents the Northeast Maryland Waste Disposal Authority	3 year from 11/1/89
*	Mr. Lawrence J. Hayward Manager, Public & Government Affairs AMOCO Corporation Represents the packaging industry	3 years from 11/1/89
*	Mr. Paul Hollinger RBL Industries 55 Raisen Tree Circle Pikesville MD 21208 Represents the packaging industry	3 years from 11/1/89
*	Mr. George T. Hudnet Regional Manager Wheelabrator Environmental Systems, Inc. Represents the solid waste industry	3 years from 11/1/90
*	Mr. James F. Katcef Vice President Katcef Bros., Inc. Represents the food and beverage industry	2 years from 11/1/89*
*	Ms. Regina J. McNeill Town of Berwyn Heights Represents the Maryland Municipal League	2 years from 11/1/89*
*	Mr. James Pittman Hazardous and Solid Waste Management Administration Maryland Department of the Environment Represents the Maryland Department of the Environment	3 years from 11/1/89

*	Mr. Lenny D. Minutillo, Jr. 18028 Bacon Road White Hall MD 21161 Represents the food & beverage industry	3 years from 11/1/90
*	Dr. Dan K. Morhaim Chairman, Dept. of Emergency Medicine Franklin Square Hospital Represents the general public	3 years from 11/1/89
*	Mr. Michael Pelczar Professor Emeritus, University of Maryland Represents the environmental community	3 years from 11/1/90
*	Mr. George Perdikakis Maryland Environmental Service Represents the Maryland Environmental Service	3 years from 11/1/89
*	The Honorable Joan B. Pitkin Delegate Maryland House of Delegatese Represents the Maryland House of Delegates	1 year from 11/1/89 ?
*	Mr. Thomas W. Redmond, Sr. 8224 Baltimore Annapolis Blvd. Represents the recycling industry	2 years from 11/1/89*
*	Mr. Barry F. Scher Vice President, Public Affairs Giant Food, Inc. Represents the Maryland Food Dealers Association	2 years from 11/1/89*
*	The Honorable Gerald W. Winegrad Senator Maryland State Senate Represents the Maryland State Senate	1 year from 11/1/89 ?

Governor's Advisory Council on Recycling

Attendance for the Year 1991

There were 12 Governor's Advisory Council on Recycling meetings in the calandar year 1991 (one meeting per month). The following attendance figures are as noted.

Members	Meetings Attended
Dr. Harvey Alter	11
The Honorable Thomas Duncan	7
Mr. Michael Gagliardo	11
Mr. Lawrence Hayward	9
Mr. Paul Hollinger	10
Mr. George Hudnet	11
Mr. James Katcef	7
Ms. Regina McNeil	3
Mr. Lenny Minutillo	8
Dr. Dan Morhaim	8
Dr. Michael Pelczar	6
Mr. George Perdikakis	8
The Honorable Joan Pitkin	4
Mr. James Pittman	12
Mr. Thomas Redmond	4
Mr. Barry Scher	8
The Honorable Gerald Winegrad	7

February 18, 1991

State of Maryland

Governor's Advisory Council on Recycling

PLAN OF WORK
1991

1.0 Introduction

This plan is a continuation of the April 2, 1990 plan of the Council. It is intended as a supplement to the original plan. The two should be read together.

Not all of the 1990 plan was accomplished due, in large, to the growing base of knowledge and understanding among the Council members. Many of the tasks were addressed and it was realized that several have to be further addressed in parts.

2.0 Tasks to be Addressed in 1991

Figure 1 is a schedule or Gannt chart of the 1991 plan of work. Some of the tasks are planned to carry over into 1992. A brief description of the tasks listed follows.

2.1 Package reduction. This task was started in 1990 and examines the effect of bans, taxes and deposits on packages as a means of reducing the amount of municipal solid waste (MSW) and increasing recycling. (Note that a further task (2.6) is planned to further examine methods of waste reduction, particularly through recycling.

2.2 Education. This task has addressed increasing public awareness by education programs in grades K through 12 and at the post-graduate university level. The task also addresses recommendations for the State to become ready for implementation of the federal National Environmental Education Act of 1990.

2.3 Raise revenues. This task has addressed methods of raising revenues to support additional recycling efforts in the State and possible ways those revenues can be used.

2.4 State procurement. This task addresses methods of increasing the procurement of items by the State made of recycled materials, and thus helping provide a "demand pull" in the market for recycled products.

2.5 Economics and financing. This task addresses means of raising revenues in the State, counties and possibly municipalities to fund recycling efforts, including the construction of Materials Recovery Facilities (MRFs).

2.6 Waste Reduction. This task is a continuation of task 2.1 to explore additional means of reducing the amount of MSW destined for disposal by recycling and possibly other means.

2.7 Economic development. This task is at the suggestion of one of the Council members to explore ways in which the establishment of recycling activities can be tied into local economic development.

2.8 Public information. This task is related to 2.2 Education. It is directed at exploring and recommending means by which the State can increase awareness of recycling in communities and thus increase participation and yield of recycled products.

2.9 Product deposits. This task is at the suggestion of one of the Council members to explore ways in which product deposits may be used to divert materials from disposal and to recycling. Some of the products mentioned are lead acid storage batteries, appliances and tires.

2.10 ONP and tire markets. Markets for ONP (old newsprint) and tires are presently demand limited. Ways must be explored to increase the demand and hence the ability to recycle these materials in Maryland.

2.11 New MRF construction. This task will explore methods by which the construction of new and additional state-of-the-art MRFs can be encouraged. MRFs are processing plants that use a combination of machinery and hand labor to prepare separated materials to meet specifications for markets. Regionalization must be included in addressing this task.

2.12 Economic feasibility. This task will analyze the economic feasibility of recycling under different circumstances. The task is scheduled for study late in the year (and into 1992) when more data will be available on markets, participation and MRF economics.

2.13 Expand centers. This task, related to 2.12, is to examine how recycling can be expanded beyond MRFs and possibly service rural and high density housing, as contrasted to curbside pickup.

2.14 Advancing MRFs. When this task is examined, there should be sufficient experience with MRFs to possibly understand how new and more efficient technology may be adopted in the State to advance the efficiency of recycling and better meet market specifications.

2.15 Rules and regulations. At some time, there will have to be State regulations governing the design and operation of MRFs and other recycling activities so as to protect public health. This is a difficult task, and possibly beyond the lay understanding of solid waste management and public health issues among the Council members.

2.16 Annual report. An annual report for 1991 is scheduled, as required. It is marked as a milestone on the Gannt chart.

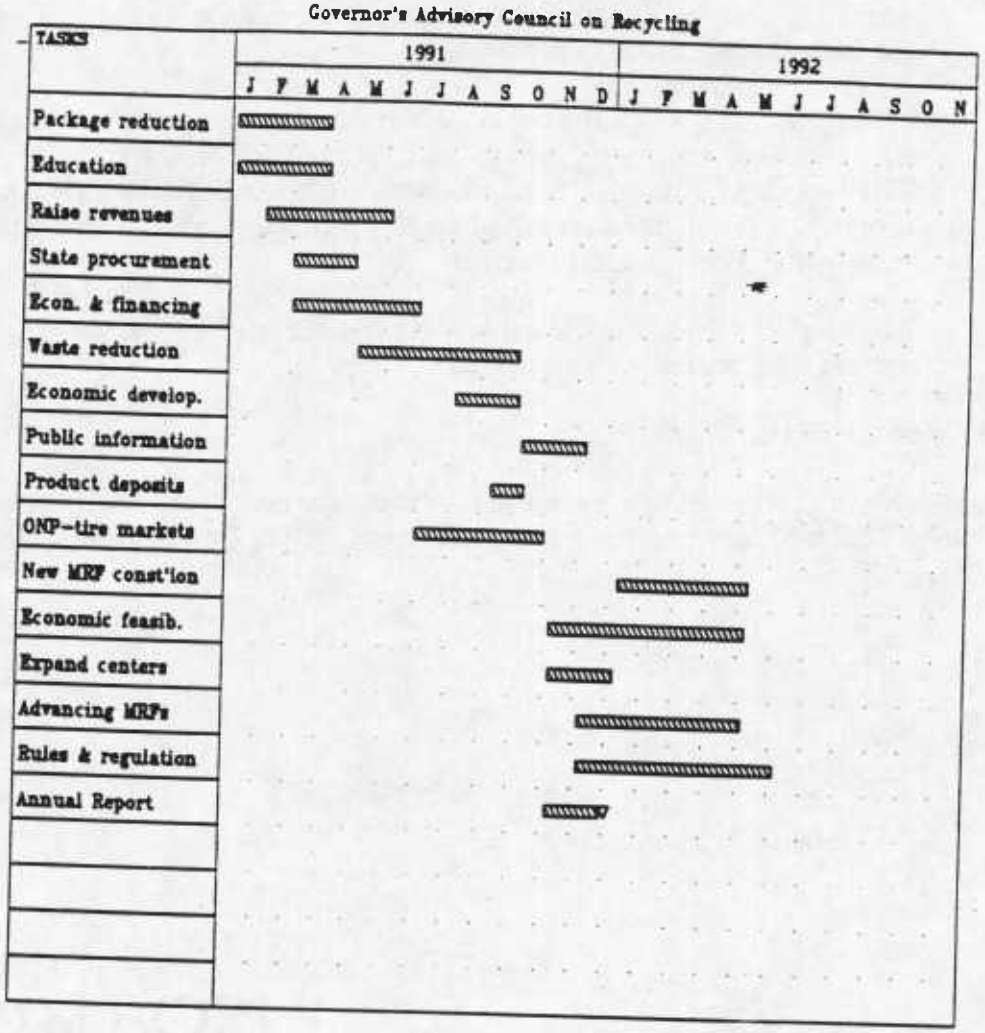
3.0 Updates of the Work Plan

The 1991 Work Plan schedule is now computerized so can easily be updated from time to time. This will also provide a progress report for the Governor and others.

February 18, 1991

1991-1992 Work Plan Schedule

Governor's Advisory Council on Recycling



State of Maryland

Governor's Advisory Council on Recycling

SUMMARY INTERIM PROGRESS REPORT

1990 - 1991

Executive Order 01.01.1989.08 established the Governor's Advisory Council on Recycling. Members were appointed in November 1989. The first meeting was in January 1990 and the Council has met monthly since then. This interim progress report summarizes the results of the Council's considerations and an appendix lists the interim reports that have been submitted to Governor Schaefer. It is important to note that these reports were prepared by the Council; no outside consultants or contractors were employed.

All decisions and approvals of the several interim reports submitted to Governor Schaefer bear the full consensus approval of the Council members. Most of the items for the Council's consideration included in the Executive Order have been addressed. The Council's plan of work (revised annually and most recently on September 12, 1991) should assure that all nine items in the Executive Order will be considered and reported on within the three years established for this purpose. Additional items have been added by the Council; some of these have been completed.

This summary report is divided into three sections: (1) a summary of the issues debated and brought to some closure; (2) areas that should be allowed to grow with encouragement or without interference; and (3) new programs that require further analysis.

1. Summary of Issues Considered

The issues considered (and reported) are summarized here according to the required Scope of the Council. Some have resulted in interim reports that complete consideration; others may require re-visiting.

Coordinating the efforts of the State to facilitate the implementation of the recycling goals at the State and County level. The Council continues to monitor the efforts of the Maryland Department of the Environment and the Maryland Environment Service in this regard. Reports are given to the Council monthly and suggestions made. The Council has participated in some of the related meetings in the State. Meetings have been held with outside experts from the public and private sectors. Consideration has been given to the establishment

of a database to assist subdivisions in their marketing of recyclable materials. The Council reviewed some of the County recycling plans.

Identifying local, national and international markets for recycling materials. The Council reviewed the Maryland Recyclable Materials Market Study of 1989. This document is an excellent starting point, which will need periodic updates.

Determining the programs necessary to educate the pubic on the need to participate in recycling efforts. This task is in progress. Recommendations have been made as part of an approach to stimulate recycling at the margin. In addition, the Council submitted an interim report establishing recycling education programs in grades K through 12 and at the post-graduate level.

Determining programs necessary to reduce the amount of solid waste generated for disposal. An interim report was submitted in the form of pamphlets to explain and encourage double-sided copying and establishment of office recycling programs.

Evaluating State procurement policies for the purchase of recycled materials. A report has been submitted on this subject with recommendations for expansion of programs at the State and subdivision levels.

Determining the costs, benefits, and effects of replacing certain packaging materials used in commerce with other recyclable materials used in commerce with other recyclable materials and the role of these materials in recycling efforts. An interim report has been submitted addressing bans, taxes and deposits for this purpose.

In addition to addressing these tasks, the Council has submitted a pamphlet on conducting waste audits for waste reduction and recycling, and a guide for purchasing recycled materials. Considerable discussion has been held regarding means of rasing revenues for recycling and waste reduction techniques. An interim report listing 15 miscellaneous steps for encouraging recycling was also submitted.

2. Areas that Should Be Allowed to Grow without Interference

The Council has been monitoring progress in the implementation of Maryland's recycling law and some of the county recycling plans have been reviewed. The law appears to be working well and no changes appear necessary at this time.

Partly as a result of the Council's activities, University College, University of Maryland College Park is working toward including solid waste recycling in their Master's in Technology Management program. This will provide much needed post-graduate education in the field. Encouragement from the State's leadership will help move plans; a small

amount of seed money could expand the planning to a more inter-disciplinary approach.

The Council considered the effects of bans, taxes and deposits on packaging materials and concluded that such actions would not assist recycling and could impede it.

3. New Programs that Require Further Analysis

Recommendations have been made for establishment and expansion of recycling education programs in grades K through 12. The Governor has directed an evaluation of these.

Recommendations have been made as to how recycling programs can be stimulated at the margin (such as by providing for additional training, interdisciplinary graduate costs, for innovation in materials recovery facilities, and for small business incubators). Additional recommendations have been made how such programs could be financed through mechanisms similar to or through the Loans for Solid Waste Facilities (1990) and similar programs.

Extensive recommendations have been made as to how to encourage purchase and use of recycled products. Some of these can be easily implemented; others require study. These recommendations were made only recently.

There are several miscellaneous recommendations, some of which require extensive study. These are:

- ♦ Determine the feasibility of including waste tires in asphalt for road paving.
- ♦ Determine the feasibility of obtaining a tire-derived fuel power plant in the State.
- ♦ Determine the feasibility of including densified refuse-derived fuel from the non-recyclable portion of office waste in a tire-derived fuel power plant.
- ♦ Encourage subdivisions to divert all leaves and other yard waste from landfill to composting.
- ♦ Determine the feasibility and acceptability of using yard waste compost for daily cover for landfills.
- ♦ Encourage all public groups and property owners to leave their grass clippings on lawns. Demonstrate the advantages of this step by demonstration, for example by doing so at Byrd Stadium, University of Maryland College Park.
- ♦ Encourage subdivisions to chip tree waste for mulch and to use this mulch on public properties.

♦ Encourage all the Department of General services, subdivisions and school systems to establish recycling and waste reduction programs at central receiving and supply centers.

♦ Encourage all rapid transit and commuter systems, and Baltimore-Washington Airport to establish newspaper recycling programs and to install convenient receptacles for the public.

♦ Expand cooperative ventures between the private and public sectors, including the Maryland Environmental Service to expand used oil recycling.

♦ Consider modifying the present five percent purchase preference for recycled products to a sliding scale so that in the initial one or more years this is higher to encourage infant industries and the preference decreasing in subsequent years until there is no purchase preference. This will ultimately increase competition and save money.

♦ Encourage subdivisions to divert all obsolete appliances (white goods) to scrap processors.

♦ Order a study (such as by the Legislative Reference Service) of all State laws to assure that there is no inadvertent prejudices against recycled materials. (This was done in 1980 for the State Solid Waste Management Commission. At that time, no such prejudices were found.)

♦ Instruct appropriate State departments to determine where more recycled materials can be used in construction.

♦ Initiate a study as to how subdivisions can phase-in user fees for waste disposal so that citizens are aware of the full costs of this service. Once this is done, there can be consideration of collection and disposal costs being tied to the amount of waste discarded.

APPENDIX

Titles of Interim Reports Submitted

♦ Guide to Buying Recycled Products

♦ Guide to Waste Audits for Waste Reduction

♦ Guide to Office Recycling

♦ Costs, Benefits and Effects of Replacing Certain Packaging Materials Used in Commerce with Other Recyclable Materials: Part 1: Package Bans, Taxes

and Deposits. Discussion and Recommendations

♦ Programs Necessary to Educate the Public on the Need to Participate in Recycling Efforts. Part 1: School Programs

♦ Economics and Financing of Existing and Proposed Systems of Solid Waste Recycling and Facilitating the Implementation of Recycling Goals. Stimulating Recycling at the Margin.

♦ Purchase and Use of Recycled Products

♦ Miscellaneous Steps for Stimulating Recycling